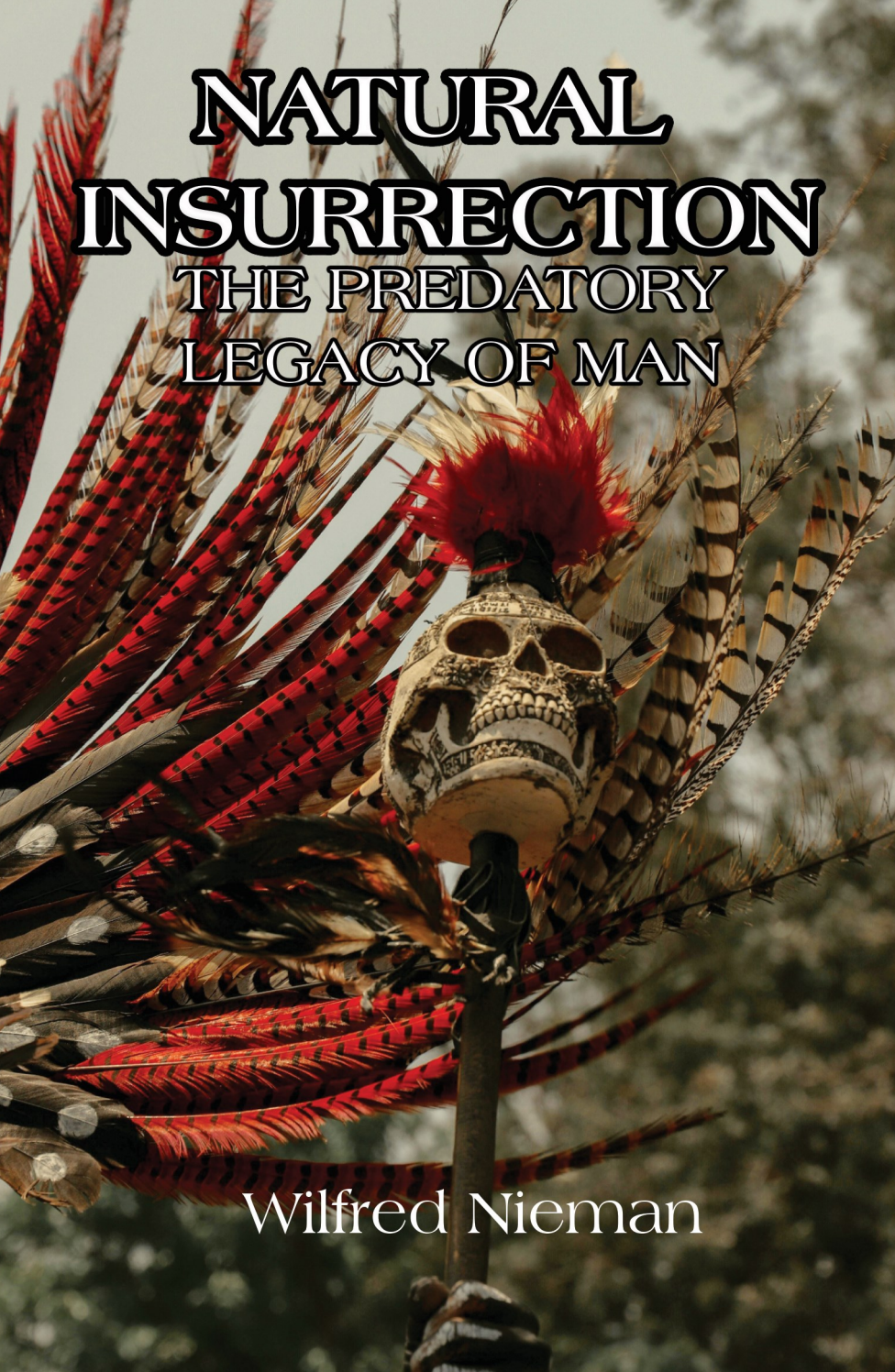


A close-up photograph of a Native American headdress. The central element is a human skull, which has been painted with intricate black and white patterns. The skull is mounted on a dark wooden pole. Radiating from the top of the pole are numerous feathers. Some feathers are bright red, while others are black and white striped. The background is a soft-focus view of trees and foliage.

NATURAL INSURRECTION

THE PREDATORY
LEGACY OF MAN

Wilfred Nieman

NATURAL INSURRECTION:
THE PREDATORY LEGACY OF MAN

WILFRED NIEMAN



KREST PUBLISHERS

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AUTHOR'S NOTE

Revisions in the classification of the great apes has led to the inclusion of orangutans, gorillas, and chimpanzees into the family Hominidae, which a few decades ago referred exclusively to humans and their extinct, bipedal relatives. Gorillas and chimpanzees, furthermore, are now included in the sub-family Homininae along with humans, to the exclusion of orangutans, given their closer genetic relationship to the human clade.

The term 'hominid' today collectively refers to orangutans, gorillas, chimpanzees, and humans, while humans and their direct ancestors enjoy the distinction of being called hominins.

I have chosen to use the word 'hominid' in its original sense to avoid confusion. The term is still in common use and is technically not incorrect, given that hominins are also hominids. Chimpanzees, in contrast, are non-hominin hominids.

*In Memory of Raymond A. Dart,
Professor of Anatomy, University of the Witwatersrand,
1923 - 1958*

PROLOGUE

They may have been unfortunate in their earthly lot, and, having had their hearts turned to unrighteousness through some corrupting influence, they may have lost the memory of the holy things which once they saw. —Plato (Phaedrus)

We've come a long way.

Gone are the days of horse-drawn carts and front-loading muskets, of whale-oil lanterns and pig-fat soap. Gone are the steam engines, the telegraphs, and the wind-driven schooners that once mapped the coastlines of newly discovered lands.

Today we have mapped the planet Mars—we've even set foot on the moon. We have mapped the inner, miniscule world that constitutes the building blocks of our own genes. We've sent probes beyond our solar system—among the stars, if you will—and now peer eagerly through the lenses of orbiting telescopes at the very foundations of the heavens themselves.

But what, despite our accomplishments, do we know of ourselves? What do we know of the creature we call Man and the circumstances that etched him into being? What, we could ask, do we know of our *inner space*, the dark beyond of our past where, amid distant nebulae and twirling black holes, the passions were fired that equipped us with the means to literally place one foot

outside of the animal kingdom? What forces were at work that induced us into becoming what we are today?

Many a great sage has sought the answers among the stars, and for millennia—from the birth of our humanness, it could be argued—we have embraced the idea of an interconnectedness with the divine. But ours is a new generation. Ours is a generation awestruck by the physical reality of creation. Our faith, if you will, has become tangible, and today we accept without an inkling of doubt that mankind is an integral part of the food chain, that we are a species of omnivorous primate that, despite our accomplishments, is a product of the evolutionary process.

Yet, in many respects, we might as well have evolved on another planet. Not content to merely exist, like some organic entity programmed to respond to instinctive impulses, we instead reflect, reason, analyse, and conclude. We manipulate the environment to the point of *altering* it for our own ends. We have learned to harness existing elements in order to produce *new* elements. We have unveiled the very fabric of life and are now able to replicate even our *individual selves* ... How, then, within the framework of natural selection, do we quantify this?

Something out of the ordinary must have been at work over the course of our development. Not the fanciful genetic manipulation by a visiting alien race, as some have suggested, or the corrupting influence of an evil entity, but something extraordinary in the natural sense, something that we can read from the pages of creation itself.

Metaphorically, if we were to say that life began at dawn, then we, *Homo sapiens sapiens*, would have made our first hesitant appearance perhaps two seconds before nightfall. While this doesn't quite put this vast expanse of time into perspective, the implication is that somewhere within the last half-second of a period of some twelve hours of daylight, we discarded our animal

skins and simultaneously took to the skies. And in a fraction of a fraction of the last half-second, we did the unthinkable and propelled ourselves beyond the atmosphere of this planet and into lifeless space.

Let us reflect on this for a moment. The period of time from the day that we cast away our last stone axe to the day that Apollo 11 landed on the moon—the transition from caveman to space traveller, in other words—comprises roughly one second when compared to the twelve hours that life has existed on this planet. In real terms, we accomplished in a few thousand years what no other species could, given hundreds of millions of years. How do we rationalise this? What instilled in us the need to outperform the rest of the animal kingdom to the extent that we have?

There are those who have argued that mankind may have ‘left the rails’, that we may have turned our backs on the natural process somewhere in our development and followed a path of our own—an evolutionary byway that, judging by our very existence, we would have embarked upon in defiance of natural order. Space travel, after all, can be considered a gross violation of the laws of nature. The idea that hundreds of millions of years of trial-and-error development, relentless competition, and bitter savagery in the pursuit of survival should culminate in the victorious entering the sterile vacuum of the beyond just doesn’t gel. Where else do the conditions that we need to sustain our fragile existence apply besides here, on the very planet that suckled us into being? Why, we could ask, are we—who have played the game of survival with greater finesse than any other—inclined to waste our time?

From an evolutionary perspective, considering that the selection process inclines towards order rather than chaos—with each organism playing its role in a general tendency towards equilibrium, however savage—Man would seem to have the mannerisms of the deranged. Not in the sense that he has no grasp on his mental

faculties, but deranged in that he has scant regard for the rules that apply in the ecosphere that brought him into being. Why, when we are an integral part of nature that shares close to ninety-nine percent of our genetic makeup with the chimpanzees (which is not far off from what the donkey and the horse have in common), have we made such enormous evolutionary strides? We are classified, after all, as a member of the superfamily *Hominoidea*, which includes the African and Asian apes. We eat, sleep, breathe, defecate, and die like any other primate, and yet, with roughly one percent of our DNA, we have split the atom and continue to monitor the progress of Voyagers I and II as they sail into the unknown beyond our solar system ... and all this while our chimpanzee cousins still scrounge for termites in their ever-diminishing tropical forests.

We differ substantially from the apes, of course, for we walk upright and are mostly hairless. But these are not unique phenomena in the animal kingdom. Our uniqueness lies in the extent of our *abilities*. The construction of tools, the possession of articulate speech, and the organisation of a complex social structure are factors that underline our distinctiveness: the possession of a brain with far greater functional ability than any other known form of life.

Interestingly, the human body was formed long before a fully human brain had evolved. Fossilised prints dated 3.6 million years old at Laetoli, Tanzania, indicate that at this time, while the gap between the big toe and its neighbour was too large to belong to *Homo*, bipedalism was well established. A million years later, with the arrival of *Homo habilis*, this form of locomotion would seem to have been as specialised as it is today. *Habilis*, in other words, more than 2 million years ago, had an anatomy very similar to that of modern man while possessing not quite two-thirds of his brain. Our distinction as humans thus effectively lies from the neck upward. Besides a refining of the

upper torso, this is where the major changes took place, where the true distinction between man and ape is evident. As the late Dr Shapiro put it in his foreword to *The Brain in Hominid Evolution*, "... the brain is a central, even a determining aspect of human evolution. For, as we learn more about this process, it becomes increasingly evident that the changes leading to *Homo sapiens* are intimately linked in a kind of feedback situation with the brain."¹

By implication, this means that while the leisurely pace of ape evolution changed abruptly with the advent of bipedalism, bipedalism itself can be seen as merely an indicator of that change. *Australopithecus*, who shared an anatomy like ours, was, after all, nothing more than an upright ape with a brain capacity comparable to that of the gorilla. Yet, with only minor adjustments to the anatomy, modern man has a brain three times larger—a brain almost twice the size of the ape-faced *habilis*, who was as specialised in walking about on two legs as we are today.

Human evolution can thus be seen as the phenomenon of primate cranial expansion—the process of the unfolding of intelligence—and the study of man an investigation into the circumstances surrounding this. The subject is not without controversy, of course. As H. S. Harrison once put it, "Man did very well before he was a man at all, and no one has given any reason why he ceased to be an ape."² Why, indeed, should the brain of the bipedal ape have continued expanding despite his circumstances remaining largely unchanged throughout this development? Today still, hunter-gatherer societies eke out a living fundamentally the same as what must have existed a million years or so ago, and yet they possess a brain at least fifty percent larger. What do they need it for? We of this modern technological era, in fact, possess brains no larger than our savage Stone Age forefathers did. Were we to clone a 30 000-year-old *Cro Magnon* cave dweller, in other words, we could

potentially educate him or her to become a professor in quantum physics. Even then, it seems, he would still not have reached his full mental potential, for contemporary research indicates that the human brain may be vastly under-utilised. As Arthur Koestler once argued, we are “still breathlessly catching up with its unexploited, unexplored possibilities.”³ The few remaining naked primitives living off rodents and tubers in remote jungle niches, by implication, have *excess* mental capacity to deal with everything that modern society can throw at them despite their lives having changed little since the transition from bipedal ape to Man.

Brain size alone doesn't determine its functional value, of course, but this does not detract from the fact that the learning capacity of the human species far exceeds its immediate requirements. This is a phenomenon that evolution has purposely omitted from its constitution if our understanding of the selection process is correct. *Necessity* ultimately dictates the extent of adaptation. Nature bestows upon her offspring as many talents as may be needed in order to *survive*—no more, and no less. Or, as Darwin eloquently put it, “It may metaphorically be said that Natural Selection is daily and hourly scrutinising, throughout the world, the slightest variations; rejecting those that are bad, preserving and adding up all that are good; silently and insensibly working, whenever and wherever opportunity offers, at the improvement of each organic being *in relation to its organic and inorganic conditions of life*”⁴ (emphasis added).

It's an inalienable principle. Life is about staying alive. Successful species will, in other words, hardly change (like the shark and the crocodile which have outlived the dinosaurs), while those whose ‘relation’ with their conditions of life is unbalanced, or those who face a threat to their survival, are necessitated to adapt or die, as the cliché goes. The lions of arid south-

western Africa, to cite an example, that have few alternatives but to prey on the gemsbok (a desert antelope species known for its propensity to use its lethal horns in defence) often overpower their prey by breaking the back rather than going for the jugular. The gemsbok's use of its horns can be seen again as a response to the same survival demands. Yet, for as long as the gemsbok can outbreed the lion's appetite, a certain harmony will exist, and as long as there is harmony, change will be minimalised.

Man alone is the great paradox. The accumulation of grey matter is not graced with harmony, it would seem. Our story is one of tumultuous change. We leapt, chattering, from the branches of our jungle homes to conquer the far reaches of the planet in what has been termed an evolutionary *coup d'état*, leaving those that we shared our branches with largely unchanged. Only a crisis, we can assume, would have been behind such explosive change ... a crisis that Man has either overcome or may still be faced with today.

On retracing our footsteps, we find that Man, in the form of *Homo erectus*, enjoyed the supremacy of being the most capable land-based predator the mammalian age had produced, more than a million years ago. With a brain two-thirds of what it is today, he had learned to hunt the elephant and, in all probability, had become too formidable a prey for the large cats. This powerful position should have resulted in a stabilising of evolutionary pressures, but we find instead that some mysterious force drove Man beyond this savage prominence to a point where he is now planning the colonisation of Mars, debating the virtues of cloning his own species, and may, in the next few generations, stall the ageing process to the verge of immortality.

These goals may well be seen as the *magnum opus* of the survival process, the ultimate quest and inevitable destination of the true survivor. What it implies, however (unlike the success of, say, the tortoise, which

has remained largely unchanged for tens of millions of years) is that despite his position as a cerebrally endowed apex predator, Man has seldom, if ever, attained a good relationship with his 'organic and inorganic conditions of life'. It is, after all, *necessity* that spurs evolution on, and if there is instilled in Man an urge for innovation and the advantage that goes along with it, then the deduction must be made that necessity lies at the heart of the matter.

What could possibly be the nature of such an impulse? What, when survival is the principal tenet, could have induced our species to make such extraordinary evolutionary strides? Whatever the cause, it certainly seems unrelated to the normal functions of the selection process. As Alfred Russell Wallace, who jointly with Charles Darwin proposed the theory of evolution by 'Natural means of Selection', himself suggested, a "much more rapid process of development" may have been at work in the production of man.⁵

More rapid, indeed. So rapid in fact that the development of the brain went beyond its requirements, the enlargement of which, according to Judson Herrick in *The Evolution of Human Nature*, "... has gone so fast and so far that the result is actually pathological."⁶ Which brings us to another aspect of our humanness: the streak of insanity that runs throughout our history. Rape, torture, suicide, self-mutilation, child molestation, etc., are impairments that we can claim as our own unique contribution to animal behaviour. Researchers in this field have claimed that there are parallels, however. Animals held in captivity are known to exhibit behaviour radically different to that of their free-ranging kin, and understandably so, for the control of free movement and association inevitably creates a situation that is unnatural. Among numerous such cases, baboons are known to have killed their females,

monkeys to have attacked their own young, and overcrowded rats to have resorted to sexual violence.⁷

In the same sense, Man can purportedly attribute his own abnormalities to the confinements of his urban lifestyle. Crammed living conditions, behavioural restrictions, unnatural dominance structures, etc., while to a degree a matter of free choice for man, are phenomena not significantly different to those that apply to caged animals. However, contrary to expecting that people living under perfectly natural conditions should, in other words, remain unaffected by the irregular behaviour of their urban counterparts, quite the opposite applies. Primitive peoples, untainted and unrestricted by even the remotest of civilisations' influences, carry within their genes the same sadism and cruelty as the urban malefactor. And paradoxically, what is labelled as criminal in the city is, more often than not, considered acceptable behaviour among primitives.

Sailors in the age of discovery came upon many such isolated tribes, some so insulated against external influences that the cultivation of crops and the domestication of animals was wholly unheard of, let alone loin cloths and clay vessels. In effect, what these people represented was *Homo sapiens* in the natural sense: Man in his unsullied form, created by the designs of Mother Nature herself. In response to their 'discovery', however, an industry of soul saving was ignited, for these vestiges of our common past were in many cases the most cruel, vicious and sinister creatures imaginable. Many missionaries took it upon themselves to turn these 'savages' from their evil ways, often becoming the victims of a cult as starkly human as our oversized brains: cannibalism.

"The usual attitude," remarks Koestler when referring to the allied practice of human sacrifice, "is to dismiss this subject as a sinister curiosity belonging to the dark superstitions of the past; but this attitude begs

the question of the universality of the phenomenon, ignores the clue that it provides to the delusional streak in man's mental structure, and it's relevance to the problems of the present."⁸

This 'clue' may in fact be glaring evidence of an evolutionary by-road, a course ventured upon that no other has taken, for, where cannibalism is a phenomenon in the animal kingdom, it was once a *practice* among men. And this practice, the fossil library indicates, reaches progressively back into the past to include species such as *Homo sapiens*, *neanderthalensis*, *antecessor*, *erectus*, and possibly even *habilis*—a lineage exceeding a million years.

It is an aspect of our origins that has been ignored, due to the nature of the subject, for far too long. Our very existence may have been determined by it. Our passions, our abilities, our analytical minds ... these could well have been forged in an environment where intra-specific violence prevailed. And the mean streak that runs through our veins—cruelty, vindictiveness, immorality—these could well be the residue of just such a tumultuous past.

Mankind, to put it bluntly, may have been born in violation of natural order. We learned to split the atom with the destruction of our fellow man in mind ...

And we did this with intelligence and aggression to spare.

1

THE ASCENT TO MAN

*Organic life beneath the shoreless waves was born and
nurs'd in Ocean's pearly caves; First forms minute, unseen
by spheric glass, Move on the mud, or pierce the watery
mass; These, as successive generations bloom, New powers
acquire, and larger limbs assume; Whence countless groups
of vegetation spring, And breathing realms of fin and feet
and wing. —Erasmus Darwin (The Temple of Nature)*

The Earth is believed to have originated from a consolidation of gases and meteoric dust. The denser particles, gravitating to the centre, would have caused friction and a buildup of heat, and gradually the core, mantle, and outer crust of our planet developed. This process was initiated approximately 4.5 billion years ago, along with the formation of the other planets, moons, asteroids, and debris of the solar system.

The earliest traces of life, the *prokaryotes* (cells without nuclei, resembling the structure of blue-green algae) are about 3.5 billion years old. These cells dominated the spectrum of life for some 2 billion years, releasing oxygen as a byproduct of photosynthesis into the primal atmosphere. It is believed that this provided the stimulus for the development of increasingly more complex cells until finally, when it seemed that conditions were perfect, a diversity of life forms suddenly 'exploded' onto the scene around 600 million years ago.

The early evolutionary strides were confined to the ancient seas. Invertebrates such as sponges and molluscs were the first to appear, and later experiments in body forms produced the likes of coral and sea urchins. By 450 million years ago, the first vertebrate animals, fish, began to dominate. Jawless, primitive types evolved into toothed species, and at the fringes of coastal swamps, some of these started feeding off the debris washed up by the oceans. By this time, simple plant ecosystems had appeared on land, followed by invertebrates such as scorpions, millipedes, and the first wingless insects.

Those feeding at the water's edge, dragging themselves along with their fins when the tides allowed, developed the capacity to breath air over countless generations, and over countless more generations, their fins developed into functional terrestrial limbs. One of the major hallmarks of the evolutionary process had thus arrived—vertebrates were now in a position to colonise the landmasses. Feeding likely predominated on land, while the laying, fertilising, and hatching of eggs continued, as it had, in the aquatic environment. By 300 million years ago, these amphibians had established themselves across the globe, where access to water permitted.

The next evolutionary innovation, internal fertilisation, then came of age. While aquatic animals typically spawn ('showering' the eggs with sperm externally), some amphibians developed the means to release swimming sperm directly onto the female's reproductive organs. This ultimately led to the laying of eggs on dry land, bringing an end to the reliance on water for reproduction. Vertebrates, as a result, could now migrate into more arid environments, where no amphibian had ventured before.

By 250 million years ago, the early dinosaurs and their relatives, the crocodiles, made their first appearance. Throughout most of the Triassic, Jurassic, and

Cretaceous periods, the dinosaurs dominated life on land, ranging from small, cat-sized species to the largest land animals to have ever developed. Then they abruptly disappeared. What catastrophic events led to their demise we cannot say, but by 65 million years ago, their reign had come to an end.

Living in the shadows of the reptilian overlords were small, warm-blooded animals that had allowed embryonic development to take place *within* the body of the female, and as a result gave live birth. With the extinction of the dinosaurs, these creatures came into their own. Limbs turned into flippers and wings, and toes turned into hooves and claws as the abandoned habitats were populated. The mammalian age had arrived, and it is here that the story of Man begins.

Somewhere in the murky past, perhaps while the dinosaurs still reigned, a member of the ancient *Mammalia* had taken to the trees in order to avoid terrestrial predators. This choice of habitat led to the development of some unique adaptations typical of the primates and without which human pre-eminence would never have been possible. To illustrate this, a comparison with existing species can be made.

The most primitive of the primates is the squirrel-like shrew. A long, pointed snout, tipped by a moist nose, is suggestive of smell being the dominant sense. The eyes are widely spaced, which impedes the calculation of distance, and it therefore prefers to run along branches rather than jump from one to the other. The hands and feet are also little more than paws. Although not resembling the primates as they are commonly perceived to be, a number of features, including their dentition, indicate an evolutionary relationship. The tree shrew is considered 'sub-primate' and categorised as such within the suborder *Prosimiae*, or 'pre-monkey'.

The lemurs of Madagascar resemble the typical primates more closely, although they too are prosimian.

The first digit of their hands and feet is set apart, enabling them to grasp objects in a pincer-like fashion. This enables them to hop from branch to branch, as they are known to do. Flattened nails rather than claws, and sensitive fingertip pads, also suggest greater functionality of the hands. The face remains elongated, ending in a moist nose, indicating that smell is still predominant. And while the eyes are set closer than those of the tree shrew, full binocular vision is not yet possible.

Tarsiers, the most advanced of the prosimians, combine both primitive and higher primate characteristics. These tiny animals have flat faces and huge forward-facing eyes. The snout is still a feature, but it is greatly reduced, and the nose is no longer moist. With increased reliance on sight rather than smell, and with the hands taking over many of the functions of the teeth, the jaws and snout have become smaller, leading to the features typical of the higher primates.

Monkeys and apes, belonging to a separate suborder known as *Anthropoidae*, are believed to have evolved from prosimian stock 40 to 50 million years ago. These animals share a number of features which distinguish them from their more primitive relatives. The eyes have completed the progression to the front of the head, allowing for full binocular vision, and manual dexterity is superior. Whereas the lemur is restricted to whole-hand control, and grasps things clumsily between the thumb and the palm, the *Anthropoidae* can hold an object with relative precision, invariably scrutinising it from different angles. This combination of visual and manipulative skill, which is uniquely anthropoid, presents a whole new world of awareness. With the addition of touch, objects become completely three-dimensional, and for this reason, monkeys and apes give more attention to their surroundings than other mammals. They are notably also more intelligent than their prosimian cousins.

At around 25 million years ago, the apes separated from the monkeys. Through a combination of vertical climbing and hanging while feeding, apes have developed an arm-swinging anatomy and are able to move about suspended from branches, rather than scurrying along them on all fours. The tail has subsequently disappeared as a balancing aid, and the tendency to assume a more upright position has increased. When, at around 8 million years ago, one or more ape species took to moving about on the ground, it seems that this vertical posture won the day. A new member of the ape family consequently emerged—a bipedal (two-legged) species, with keen eyesight, sharp intelligence, and superior dexterity which, with the freeing of the forelimbs, could be applied to maximum advantage. An increased reliance on tools would seem a natural progression, resulting in an extraordinary creature with extraordinary potential.

Alas, the story of Man is anything but clearcut. As early as the nineteenth century, evolutionists were already at pains to explain our existence within the framework of the selection process. Primitive hunter-gatherers at the time, subsisting at the level of the animal kingdom, were anatomically as modern as the scientists studying them—a fact that flew in the face of the fundamental principle of the new philosophy, namely that organisms develop in response to their survival requirements. In what way, after all, would one explain how the creators of a technologically advanced civilisation should be no different, morphologically, to Stone Age barbarians?

Conservatives at the time raised the argument that, contrary to having evolved from primitive stock, Man had in fact degenerated from a superior generation. Inspired no doubt by the fall of biblical Adam, and citing as ratification the decline of ancient civilisations, this 'degeneration' lobby had a strong following. The

small band of evolutionists, on the other hand, had in their arsenal only the bones of Neanderthal man, an extinct *Homo sapiens* with a body resembling that of the fabled European troll and a brain substantially *larger* than modern humans. As late as 1911, the prominent English geologist W. J. Sollas still wrote, "... as we proceed backwards in time the human brain increases rather than decreases in volume."¹

Darwin and Wallace meanwhile, who had jointly delivered their preliminary papers on evolution before the Linnean Society in 1858, parted ways concerning their understanding of human development. Darwin envisaged a transitional form between ape and man, having somehow developed according to the dictums of evolution—a gorilloid species possibly from Africa, or a weaker form that may have developed in isolation. Wallace, on the other hand, believed that with the arrival of the human brain, the whole nature of the selection process had been altered. "Natural selection could only have endowed the savage with a brain a little superior to that of an ape, whereas he actually possesses one but very little inferior to that of the average member of our learned societies," he argued.² His own view on the matter was that the human body had evolved within the framework of natural selection but that the same could not be said of the human brain. Man, in essence, was endowed with talents beyond the requirements of survival. An article in the *Edinburgh Review* at the time best describes Wallace's stance: "If we do not admit that latent capacities in the savage brain were implanted for use at some time in the distant future, we can only say that they are the result of a force which we do not know, and of a law which we have not grasped."³

Physical evidence of man's earlier evolution began with the discovery of *Pithecanthropus* in 1891, named after the hypothetical ape-man of the German zoologist, Ernst Haeckel. Two primate teeth and a skull cap led its

discoverer, Eugene Dubois, to initially classify it as belonging to the chimpanzee family, but with the further discovery of a femur, he presented it to the scientific community as the link between ape and man. What he had in fact discovered was a hominid (belonging to the family of bipeds), immediately ancestral to archaic *Homo sapiens*, later to be renamed *Homo erectus*. With only fragmentary remains to back his theory, however, Dubois received little initial support.

A masterful forgery in 1912, on the other hand, was received with great enthusiasm. Somebody had got it into their head to skilfully combine an orangutan jaw with a *sapiens* cranium. This ‘discovery’, named the Piltdown Skull, suggested that cranial development had been more rapid than the rest of the body, and it was subsequently surmised that the human brain had evolved *before* an upright posture was developed. Pioneering discoveries were meanwhile producing more large-brained *Homo sapiens* fossils, thus further contributing to this assumption. The search was on for a large-brained ape—a knuckle-dragging Yeti whose remains in all probability would be found in east Asia.

Against this background, the thirty-two-year-old little-known anatomist Raymond Dart presented, in 1925, to the international community his ‘missing link’: the small, gracile, bipedal, ape-brained *Australopithecus africanus*—the South African Ape. In all aspects, this species represented an ape, but the angle at which the head would have joined the neck suggested to Dart that it had walked upright and thus constituted the link between humanity and the animal kingdom.

Both Darwin and Wallace were vindicated. Darwin for reasoning that the cradle of mankind would be discovered in proximity to its closest living relatives, the gorilla and the chimpanzee, and Wallace, significantly, for contending that the human form predated the development of the brain. “My argument is,” he had written to Darwin, “that this great cranial difference has

been slowly developing while the rest of the skeleton has remained nearly stationary.” On the Piltdown skull, ‘discovered’ a year before his death, he commented, “it does not prove much, if anything.”⁴

Dart’s discovery, however, meant the coming of age in the realm of professional criticism for the young professor (who was thirty-one at the time of the first announcement in the *Star* on 3 February 1925). Not only had he found the wrong kind of pre-human; he had found it at the wrong end of the world. “Criticism, rather than adoration of their potential ancestry, seemed to be the overseas reaction,” he commented later. One authority sardonically ascribed his recognising an ‘ape-like skull’ as the missing link to divine guidance. Another termed his claim as ‘preposterous’. The public lambasted him as feeble-minded, a priest of Baal, and an ‘active agent of Satan’.⁵

Friends and colleagues in South Africa were fortunately more favourably inclined. De Bruyn, the quarryman who discovered the skull in a limestone deposit, immediately recognised it as something significantly different to the baboon skulls he had been collecting for some time. And Robert Young, then professor of Geology at The University of the Witwatersrand where Dart had his medical school, was sufficiently intrigued by the specimen to arrange for its delivery to Dart from outlying Taung. The most stalwart support, however, came in the form of the Scottish physician Dr Robert Broom, whom on his first contact with the Taung skull dropped to his knees ‘in adoration of our ancestor’, as he put it to Dart. He wrote in *Nature* soon afterwards, “We seem justified in concluding that in this new form discovered by Prof. Dart we have a connecting link between the higher apes and the lowest human types.”⁶

Dart’s peers remained critical, and when international attention excitedly diverted to China the following year, where the teeth of a specimen resembling Dubois’

Pithecanthropus erectus were found, Dart (despondently, it would seem) turned his attention to building up the Witwatersrand Medical School. A decade passed, with no formal search for further Australopithecine remains being initiated. China meanwhile had produced several specimens of *Homo erectus*, a species with two-thirds the brain capacity of modern man, and books published in response to these finds either opposed Dart's interpretation of his fossil or omitted any mention thereof, as had Louis Leakey in his *Adam's Ancestors* of 1934.

The story of *Australopithecus*, however, besides a brief introduction, had not quite begun. In 1936, Robert Broom, palaeontologist at the Transvaal Museum, discovered the cranial remains of a creature belonging to the same species as Dart's among the debris blasted from a cave near Johannesburg. And in 1938, with the fragments found at a neighbouring site, he was able to piece together portions of the skull of a creature sufficiently different to receive a new name: *Paranthropus robustus*, or 'robust near man', as he called it.

The pieces of the human puzzle were starting to fall into place. With the further discovery of a nearly complete cranium of an adult *africanus* in 1947, and only months later both the hip bones, a portion of a thigh bone, and several vertebrae of the same species, Broom was able to confirm the bipedal nature of these 'southern apes'. In the years that followed, Broom and Dart together documented several dozen new, small-brained hominid fossils.

The anthropological world was compelled to review its stance. Africa had now become the focus of human origins, and the search for large-brained apes was soon abandoned. What the two fossil hunters had brought to light, after some deliberation over the various finds, is what are now generally recognised as two distinct species of 'southern apes': the small and gracile *Australopithecus africanus* which, judging by its

smooth teeth, is considered to have been an omnivore, and the heavy-boned *Australopithecus robustus* whose huge, worn molars are suggestive of a tough, vegetarian diet.

Then, in 1959, Mary Leakey, working independently with her husband in Tanzania, discovered the remains of yet another robust species, which was named *Zinjanthropus boisei*: ‘East African Man’. The brain capacity of this creature was about the same as that of *robustus*, but in other respects it was hyper-robust and subsequently became known as the ‘Nutcracker Man’. In 1964, the same site led to the further announcement of a gracile, larger-brained species that had coexisted with the robust *boisei* around 1.8 million years ago, named *Homo habilis*.

A fresh perspective on human evolution was now taking form. *Africanus*, the smallest-brained of the specimens at the time, was seen as a common ancestor existing 2 million or more years ago. Adapting to new circumstances brought about by its bipedal nature, two descendant lines were envisaged. On the one hand was an *africanus* – *robustus* – *boisei* line, representing the development of increasingly robust features in response to a tough diet of tubers and the like, and on the other hand an *africanus* – *habilis* – *erectus* line, noted for a softening of the features, and a significant increase in brain size. The robust lineage, stabilising at a brain volume of roughly 500 cubic centimetres (cc)—which is equivalent to that of the modern gorilla—constituted an evolutionary dead end, while the omnivorous or gracile hominids, where cranial capacity had increased from the average 450cc of *africanus*, to 675cc in the *habilis* specimen, and 900cc and more in the *erectus* specimens found in China, eventually led to the arrival of *Homo sapiens* himself.

Our human roots had thus finally been exposed. The family tree that they supported, however, would prove to grow increasingly complex, more like a human bush

in fact, to use Richard Leakey's analogy. In 1974, Donald Johanson discovered the remains of a hominid in north central Ethiopia that was almost a million years *older* than *affricanus*. The skeleton, of which nearly forty percent was recovered, left no doubt that the individual had walked with an erect bipedal stride 3 million years and more ago. *Africanus* was, as a consequence, placed in direct descent of the new, smaller-brained species, named *Australopithecus afarensis*, while retaining its status of being the precursor to the larger-brained *robustus*. But then, in 1985, Alan Walker discovered the skull of a hominid in Kenya with a cranial capacity even smaller than that of *afarensis*, dated, however, at 2.5 million years—thus concurrent to the existence of *affricanus*—and of the robust type, to which *affricanus* was supposedly ancestral!

Our past was growing more far-reaching in its implications with each new discovery. It was now becoming apparent that a number of different species had evolved over time, and that contrary to being ancestral, one to the other, several may have co-existed. And to further confound matters, a hominid dated at 4.4 million years old was discovered in 1995. *Ardipithecus ramidus*, as the type specimen is called, exhibited features distinctly more primitive than those of *Australopithecus*. The fingers were long and curved, characteristic of tree climbing, and the teeth and jaw decidedly more apelike. The estimated angle at which the head joined the neck, however, suggested an upright posture, thus placing this species at the 'root' of the hominid lineage, as the name in the Ethiopian *Afar* language suggests.

Few researchers at the time would have guessed, however, just how ancient our bipedal roots would still prove to be. In the year 2000, the so-called 'Millennium Man', *Orrorin tugenensis*, was announced, the remains of which had been recovered from Kenyan sediments

more than 6 million years old. The discoverers, Pickford and Senut, argued that, “the postcranial evidence suggests that *Orrorin tugenensis* was already adapted to habitual or perhaps even obligate bipedalism when on the ground, but that it was also a good climber.”⁷ And then, as if to dispel the doubts raised by this unexpected claim, another *ramidus* specimen was unearthed by Haile-Selassie in 2001, bearing an age of between 5.2 and 5.8 million years old.

“We need to call for the recalibration of the molecular clock,” Professor Phillip Tobias declared at the 2001 ‘Evolution of Mankind Symposium’ in Johannesburg in response to these discoveries. “The fossils demand it.” The popular consensus among geneticists at the time was that humans and chimpanzees had gone their separate ways no more than 5 million years ago, and, by implication (considering the latest discoveries), chimps had either evolved from a bipedal ape, or the molecular dating methods were flawed.

One technique, however, which measures the extent of hybridisation of the DNA molecules (where other studies have focused on the differences in proteins) has indicated that the human-chimp split may have taken place somewhere between 6.3 and 7.7 million years ago,⁸ which would seem to concur with the physical dating of *Orrorin*. This is significant in that the Earth underwent some dramatic changes around this time, which may go a long way in explaining why a certain genus of ape felt the need to move about on the ground.

The split between the apes and the Old-World monkeys took place more than 20 million years ago, the fossil records indicate. This doesn’t imply that they were instantly distinguishable from one another, of course. The changes would have been imperceptibly gradual, and the early phyletic apes (classified as apes), dating back some 16 million years, were still quadrupedal walkers and climbers, showing little sign of forelimb suspension.

From about 15 million years ago, during what is known as the Astaracian Age, fluctuations in sea levels allowed for the migration of *fauna* across land bridges that formed between Africa and Eurasia, and it is at this time that apes start making their appearance on the Eurasian continent. It was also here, contemporary evidence would suggest, that the major changes in their morphology took place. Between 8 and 13 million years ago, following the geographical expansion of apes into China, Malaysia, Indo-Pakistan, and Europe, a variety of new species, distinctly more ape-like than their African predecessors, had evolved. These ranged in size from the small *Ankarapithecus* of less than thirty kilograms to the chimp-sized *Sivapithecus* and the large-bodied *Ouranopithecus*, about the size of a female gorilla. Skeletal features indicate that while a number combined both quadrupedal and suspensory locomotion, others again were very similar to modern-day apes. Indeed, a detailed examination of tooth specimens of the 7.2-million-year-old *Graecopithecus freybergi* discovered in Greece suggests that it may be more closely related to *homo* than to the chimpanzee.⁹ Then, at 7 million years ago, the European apes anomalously disappear from the fossil records.

The pattern on the African continent appears to have been quite the opposite. At the time that these early apes were flourishing in Eurasia, they were disappearing in Africa to the extent that by 12 million years ago, few, if any, of the African apes had remained (the so-called 'African ape gap'). And then, roughly concurrent with the disappearance of the Eurasian apes, Africa suddenly experienced a resurgence of hominoid *fauna*. And not of the intermediary types, mind you, exhibiting perhaps a measure of quadrupedal physiology, but the modern types, *Samburupithecus* and *Nakalipithecus*—both of whom resembled the gorilla—and the 7-million-year-old *Sahelanthropus*, who some researchers have argued may have been bipedal.

This unusual train of events leaves us with two possible scenarios to consider: either apes continued evolving independently in Africa parallel with their Eurasian counterparts and we just haven't come up with the physical evidence to confirm this, or the Eurasian apes migrated back into Africa. Accepting that apes may have evolved separately in Africa and produced the same forelimb specialisations that developed in Eurasia would, however, imply that conditions on the two continents must have been pretty much the same, and this was not necessarily the case. The Eurasian continent had been separated from Africa for many millions of years before continental drift brought them together, and, having occupied the more temperate northern latitudes during this time, the vegetation would have been markedly different.

Obviously, whether inhabiting tropical or temperate forests, the same locomotive principles would apply. However, considering that apes have essentially evolved as frugivorous anthropoids, the continent with the greater variety of available fruit then becomes the more likely nurturing ground. And while Africa may today have in excess of a hundred edible plants, it is Eurasia that produced the pear, nectarine, tangerine, orange, plum, prune, peach, apricot, apple, grape, litchi, mango, banana, kiwi fruit, and more.

To put this into perspective, the principle of mutual co-evolution, or *mutualism*, should be considered. Mutualism implies that certain plants and animals may evolve cooperatively, to the benefit of both. The most illustrative example is perhaps the way in which many plants have developed attractive and sweet-scented flowers to lure bees to their reproductive organs with the promise of nutritious nectar. The bees, in return, unwittingly see to it that the plant's genetic material is distributed throughout the area. The dispersal of seed is engineered in a similar manner. Embedded in a nutritious outer pulp, which we call the fruit, seed is

generally dropped to the ground where a myriad of creatures sees to its dispersal when consuming the 'pulp'—the more palatable varieties obviously enjoying greater success. Where birds are the unwitting distributors, small berries are typically consumed, whereas the likes of melons and squashes rely on larger terrestrial herbivores to disperse their seeds.

In North America, a continent that has no history of anthropoid habitation (and incidentally occupies the same latitudes as Eurasia), berries abound. Here are found, among others, blueberries, cranberries, blackberries, native cherries, strawberries, and goose-berries, all typically growing in close proximity to the ground where rabbits, racoons, deer, and even bears see to their dispersal. Interestingly, Eurasian fruit such as grapes, bananas, and citrus fruits are also classified as berries, and plums, peaches, and apricots belong to the same family as cherries. The obvious differences can be ascribed to *primate* selective pressures. Primates as a rule don't eat off the stem but pick their fruit by hand, and so besides visual attraction, a firmer, more easily grasped fruit would enjoy better dispersion. Typically, also, fruit growing further from the ground would be favoured, encouraging the growth of trees rather than shrubs.

In what is the most unparalleled example of the mutual co-evolution of plant and animal, Man (in essence still a fruit loving ape) has distributed his favourite fruit-bearing *flora* across the length and breadth of the planet, wherever they may take root. And these fruits, by and large, originate from the Eurasian continent. Therefore, acknowledging the fossil record for what it is, and given the corroborative evidence of *mutualism*, the likelihood is that true apes evolved exclusively on the Eurasian continent and, by implication, that some of these apes at some point migrated into Africa.

It is the circumstances surrounding this migration that may provide the first clues in the quest for our early beginnings.

Robert Ardrey, a popular writer of the 1960s and 1970s, referred to Man as the 'bad weather animal' when considering certain climatic conditions that are believed to have induced our unique adaptations, but he spoke of an African genesis, and the bad weather would have started in the north.

Towards the latter part of the Oligocene, a geological epoch that ended approximately 25 million years ago, the drifting of the continents towards their present positions resulted in the isolation of Antarctica in the south. Polar waters, which until then would have been dissipated northwards by ocean currents that followed the contours of Australia and South America, became confined by what is today the Antarctic Circumpolar Current, which flows uninterrupted around Antarctica. This thermal isolation had a cooling effect on the planet, causing a progressive decline in global temperatures.

Initially, conditions would seem to have been idyllic, with broad-leafed vegetation thriving throughout Africa and extending across the Arabian Peninsula into Europe, India, and China. But with each passing season of rain and snow, the polar caps would have retained their share of available moisture until, by 10 million years ago, major continental ice sheets had developed.

Sufficient time had elapsed, we can assume, for the apes to develop much of their unique morphology. The arm-swinging anatomy so useful for getting to those hard-to-reach morsels, and the use of the feet as additional grasping appendages, would have featured by this time. This mastery of their environment, however, left them ill-equipped to deal with conditions on the ground, and the increasingly colder, drier climate was systematically destroying their habitat. The lush

vegetation was being forced southwards towards the equator, along with the creatures that depended on it, and it seems that at least two species of apes, the forebears of the orangutans and gibbons, managed to work their way into the Malaysian tropics. But not all would have been as fortunate. Prisoners of their dwindling forests, we can surmise that many apes found themselves isolated in wooded enclaves that, for generation upon generation, were becoming more and more unsuitable for arboreal vegetarians, and these vegetarians were then forced to either supplement their diets with surface-growing *flora* or face extinction.

Fortunately for us, among these were those that managed to adapt to the changing circumstances. The process would have been gradual, constituting perhaps an occasional termite-fishing spree on the ground or feeding on stems and bamboo shoots. Over time, however, the Eurasian apes would have developed characteristics comparable to that of the African great apes—the gorilla and the chimpanzee. Indeed, the definition ‘great ape’ could be applied to a number of Eurasian fossil specimens. *Gigantopithecus giganteus* from India, for instance, weighed well in excess of 100 kilograms and was undoubtedly a terrestrial creature, considering its bulk. Its jaw was thicker and more massive than that of the gorilla, with thick enamelled teeth suggestive of a diet of tough, surface-growing foods. *Ouranopithecus macedoniensis*, discovered in Greece, weighed an estimated ninety to 100 kilograms and likewise consumed food that required crushing and grinding. The facial morphology of this particular ape in fact suggests a possible relationship with the African great apes.

Ankarapithecus meteai, a species from Turkey estimated at 10 million years old, led the authors of an article in *Nature*, 25 July 1996, to conclude, “The combination of characteristics in A595-500 [a skull believed to be that of an adult female] link together the

European Middle and Late Miocene fossil apes in the genera *Dryopithecus*, *Ouranopithecus* and *Ankara-pithecus* as stem members of the great ape and human clade and do not provide evidence for relationships with either the [fossil] African apes or pongines [orangutans].”¹⁰

One species, the 7-to-9-million-year-old *Oreopithecus* from Italy, has drawn particular interest. Anthropologists Köhler and Moyà-Solà contend that a number of skeletal features are consistent with upright walking and that the lower body of this creature falls somewhere between that of the modern apes and the hominid *Australopithecus*.¹¹ The big toe was, however, set at ninety degrees from the other toes (similar to the way that we humans walk on our hands), so movement was probably restricted to short distances. Significantly, this creature’s remains have been discovered in ancient swamp beds on what was once an island isolated by the periodic influx of Atlantic waters into the Mediterranean which, given a probable lack of predators, would have made the ideal nurturing ground for a transition from the trees.

This, incidentally, was one of the scenarios that Darwin had envisaged for the ‘intermediate condition’ of human development.¹² There is, in fact, mounting support for the idea that the transition from an arboreal to a terrestrial lifestyle was made possible under semi-aquatic, or *aquaboreal*, conditions. Unlike monkeys that can run along the ground as comfortably as they do along branches, the grasping appendages of canopy-dwelling apes like the orangutan and gibbon render them almost useless—and vulnerable—when on the ground. Wetlands, however, where trees typically abound, offer the opportunity to consume *flora* such as water lilies and the roots of reeds with minimised exposure to predators. This so-called ‘aquatic theory’ suggests that the first transitionary forms were possibly waders, feeding off marsh vegetation and perhaps

crustaceans, and that the bipedal stance was in this way fostered. It certainly does approach the problem of the vulnerability of the early apes when on the ground and may even shed some light on the incidence of syndactylism, or webbed feet, among gorillas.

Be that as it may, the indications are that a number of Eurasian apes had grown accustomed to the changing environment prior to their disappearance from the continent, and the assumption that they went extinct along with their broad-leaved forests is therefore not necessarily correct. In Europe, for instance, those migrating south on the heels of favourable vegetation would have ended up at the shores of a very different Mediterranean Sea. The Strait of Gibraltar did not exist at this time, and the exchange of water between the Atlantic and the Mediterranean was limited to channels in the region of present-day Morocco. Indeed, these waterways were progressively closing in response to declining sea levels and tectonic shift, eventually leading to the isolation of the Mediterranean approximately 7 million years ago.¹³ By then, we can surmise, a number of European apes could already have found their way into northwestern Africa.

On the eastern flanks of the Mediterranean, those migrating south through the Middle East would have ended up at what is the Red Sea today. In those days, it would have been recognised for what it was: a rift valley caused by the separation of the Arabian Peninsula from the African continent. Currently drifting apart at roughly fifteen millimetres per annum (which translates to fifteen kilometres per million years), the Red Sea at that time would have been considerably narrower and, given the increasingly drier conditions, also much shallower, with land exposed at its northern and southern ends.

At the southern extremity, a land mass once existed which has been referred to as the Afar Isthmus, connecting south Arabia to the Horn of Africa.¹⁴

Ethiopia, in other words, was once accessible from Yemen, and for the migrating apes, this would have meant the end of their journey. At only fifteen degrees north of the equator, Yemen at the time most likely still harboured forested areas, and as fortune would have it, these forests would have reached further south across the highlands of Ethiopia into high-lying equatorial Kenya and beyond into the highlands of Tanzania. Only a few days' march to the west lay the mountains of equatorial Uganda, Rwanda, and Burundi, where today our forsaken cousin, the Mountain Gorilla, makes his final stand.

Towards the end of the Miocene, the waters of the Indian Ocean finally invaded the Red Sea, putting an end to migrations in this area. By then, we may assume, some of the Eurasian apes could already have established themselves in the warmer latitudes of Africa. Who would have made it? *Oreopithecus*? *Ouranopithecus*? *Ankarapithecus*? And by the time they arrived in Africa, could they have undergone sufficient morphological change to be renamed here *Samburupithecus*, *Chororapithecus*, or *Nakalipithecus*?

For now, we just don't know.

What we do know is what we have become: a fully bipedal, terrestrial ape with long, slender limbs that can potentially, considering the record times of ultra marathons, carry us the distance of 100 kilometres in six to seven hours. We can lope alongside the hunting dog and trot beside the horse, even chase deer to exhaustion. We, an arboreal creature, have stumbled upon a design that can compete with the best of the quadrupeds ... all we lack is speed.

We differ from the apes not only in our terrestrial adaptations, however. We have become hairless for some reason and possess an excessively large brain. We can communicate our thoughts and have become proficient in creating things with our hands. Added to this, we have reached a level of aggression and

bloodthirstiness that has the animal world fleeing in abject terror at the mere sight of us.

We have become predators, which is arguably the most profound transformation that any species can undergo.

2

PREDATORY DELINQUENCY

Working and becoming are the same; when the carpenter stops working, the house will stop becoming. Still the axe and stop the growth. —Meister Eckhart

Life on Earth would have looked totally different today if it weren't for the role that predators were designed to play. It's one of the paradoxes of nature that without the threat of being devoured, things hardly change and, by implication, hardly develop. Indeed, the 'adapt or die' principle is fundamental to the evolutionary process.

Take the South American three-toed sloth, for example. It lives almost entirely on leaves, so whenever the need arises to eat, it merely reaches out an arm for a mouthful. There are no predators to disturb it where it hangs suspended upside down from the highest branches, with the result that it sleeps up to eighteen hours a day and is quite incapable of moving faster than about one kilometre per hour. As David Attenborough describes it, "It is virtually dumb and its hearing so poor that you can let off a gun within inches of it and its only response will be to turn slowly and blink."¹

Ironically, the sloth can be considered a successful species. It has managed to avoid the attention of the Amazonian carnivores while having an uninterrupted supply of food—an enviable situation for any prey

animal. Yet nature has been harsh in rewarding its accomplishments, and like the dodo, which lacked the sense to keep clear of hungry sailors, the first predator that manages to intrude into the sloth's very secure world will probably completely annihilate it.

Predator and prey share a non-reciprocal interdependency, if you will. Each develops according to its own needs, yet those needs are by and large determined by the other. Simply put, the need to eat is counter-balanced by the need *not* to be eaten, and in the process, weaknesses are eliminated on both sides. Abilities are honed, and innovation is encouraged. Where advantage is stumbled upon, progress is made. In short, they evolve together, and as a result, life on the entire planet evolves.

Predation, of course, is not limited to the common perception of the prowling hunter and its fleet-footed prey. The tree, for instance, regards the leaf-eating sloth as *its* predator. The grass below is the 'prey' of the deer, which in turn is 'hunted' by the blood sucking tick. Obviously, there are different levels of intensity involved, but the threat of extermination remains the underlying factor. The deer may not necessarily destroy the grass, but then the cricket might. The tick may be only an irritation to the deer, but then again, a recent study found that winter tick infestation was responsible for up to seven out of ten deaths among moose calves in New England, USA.² And while a world of difference may lie between the threat posed by a herbivorous creature on a blade of grass when compared to the kind of intensity that literally encourages fish to fly, the fact remains that at almost every level of existence, there is some form of offensive and defensive activity going on.

But this wasn't always the case. There was a time when the biosphere was entirely autotrophic, or 'self-feeding' as the Greek implies. Marine microorganisms that produced their own organic compounds, either through photosynthesis or chemosynthesis (such as

exists at hydrothermal vents on the ocean floor), once represented the entire spectrum of life. For millions upon millions of years following the formation of the oceans, single-celled, algae-like microbes floated along with the currents content to merely soak up the rays of the sun for a living. They alone ruled the waves, so to speak, for an epoch which rivals that of the dinosaurs and the mammals combined.

And then they started to change. Some became larger. Some became more streamlined in form. Some developed whip-like appendages which increased manoeuvrability, and others gained hair-like protrusions called *pili* which enhanced the ability to grasp or cling. Hardened cell walls and even spiny exteriors developed, leaving little doubt that defence was the primary objective. Clearly, the passage of time had introduced elements other than peaceful photosynthesis.

Overcrowding, undoubtedly, would at some point in time have had a major impact on the development of these organisms. The competition for available sunlight would have favoured the stronger and the more agile and, in all likelihood, the formation of cooperative clusters or colonies, leaving the weaker and more cumbersome to eke out a living in the shadows below. More pertinently, however, the struggle for sunlight would have encouraged the search for an alternative to photosynthesis, a means of surviving in the absence of sunlight.

It is here where the story of predation begins.

Somewhere in the unfathomable depths of the past, one of these microbes managed to augment its energy needs by utilising the nutrients produced by another. In other words, it ceased to be 'self-feeding', instead becoming a *consumer* rather than a producer of organic material. The food chain was introduced as a consequence, effectively putting an end to the autotrophic world. Just where in the feeding hierarchy this creature found itself, however, remains a matter of conjecture.

Was it a decomposer, recycling organic waste? Was it a scavenger, living off the nutrients of the dead? Perhaps it was parasitic, siphoning nutrients from the living. Perhaps even, it *consumed* the living.

We may never know, of course, but if we were to look for clues, then we would have to consider the phenomenon known as ‘pre-adaptation’. Pre-adaptation implies that some form of morphological pre-conditioning is necessary before organisms can depart from the norm. Penguins, for instance, are proficient swimmers by virtue of their flippers having been pre-adapted for flight. Flying fish can travel hundreds of metres through the air because their ‘wings’ are pre-adapted to propel them through the water as fins. Similarly, albeit at a molecular level, the transition from autotrophic to heterotrophic (consuming energy as opposed to producing it) would only have been possible if there had been some form of pre-adaptation to facilitate this.

Interestingly, the exchange of organic material between prokaryotic cells (single-celled organisms which include bacteria and archaea—the living representatives of the earliest forms of life) is well documented. As of writing, sixty-seven individual species have been identified that share their DNA through a process called ‘natural transformation’, which involves the transfer of organic material through a medium such as water.³ Some species share their DNA through conjugation, where cell-to-cell contact is made either by clinging to one another or by way of a conduit which connects the individual cells. In species-rich communities, certain bacteria are even known to ‘cross-feed’ each other, transferring metabolites where nutrient stress, or deficiency, is evident. One particular experiment that was conducted at the Max Planck Institute for Chemical Ecology, Germany, indicated that, “direct contact between cells [via nanotubes] was required for the nutrient exchange to occur.”⁴

An autotrophic microbe all the way back in the Precambrian, in other words, may well have been sufficiently equipped to turn its back on photosynthesis. Having evolved to a point where organic material was cooperatively exchanged, it follows that at some stage the exchange could have become non-cooperative. *Predation*, in other words, would have entered the fray, introducing the biosphere to a new phenomenon: hostility and the dynamics of offence and defence.

A number of predatory prokaryotes have been identified in recent years, providing a unique perspective in this regard. For instance, the bacterium *Vampirovibrio chlorellavorus* sucks out the cellular contents of the green algae *Chlorella* by attaching itself to the cell wall of its prey. *Vampirococcus*, likewise, adheres to the cell wall of the phototrophic bacteria *Chromatium*, where it reproduces while sucking out the nutrients. *Daptobacter* again collides with and penetrates its host, where it divides and grows, leaving behind only the cell wall when it is finished.⁵ One particular species, *Bdellovibrio bacteriovorus*, which similarly burrows through the outer membrane of its host to feed and reproduce, has received considerable scientific interest as a possible 'living' antibiotic, preying on no less than 145 of the 168 different microbes it was exposed to in one particular study.⁶

The very first prokaryotic organism that went on the offensive would not have had as diverse a selection of prey as its modern counterpart, of course. The selection process would still have been in its infancy, and we can assume that, taxonomically, the aggressor would have shared a close relationship with its victim. This raises the question: At what level of speciation (the development of separate species) did predation first make its appearance? How closely related was the very first predator to its prey?

Researchers at the Centre for Molecular Ecology and Evolution, Massey University, New Zealand, ran an

interesting computer simulation to explore how a population of single-celled organisms would evolve given only “basic physical, biological and ecological principles.” The results showed an early specialisation into producer and consumer cells.⁷ In fact, predation appeared “within a thousand or so generations” into the simulation,⁸ which implies that the relationship between predator and prey was very close indeed.

The conclusions of this study are theoretical, of course, but it reinforces the idea that predation may have reared its head when living organisms were essentially all still the same. In other words, the very first ‘involuntary transfer’ of organic material between two prokaryotic microbes could well have been between members of the same species.

Predation among members of the same species is of course better known as cannibalism which, in the absence of corroborative evidence, is a charge the first hostile microbe may be excused of. Yet, it still remains guilty of having turned against its own kind in the broader sense of the term. After all, photosynthesising organisms were not designed to feed on other photosynthesising organisms. Despite this, at some point there must have been some form of predatory exploitation going on between them, or we wouldn’t be here today. And while this may not have been an act of cannibalism *per se*, it nonetheless denotes a level of misconduct akin to it.

Suffice it then to say, for want of clarification, that the very first hostile transfer of nutrients from one organism to another can be ascribed to an act of predatory *delinquency*.

The die was cast. The producers of energy now had to contend with the consumers of energy, and it didn’t end there. The consumers *themselves* were at risk of being consumed. Natural selection, as a result, came into its own, producing from a world of phototrophic

micro-organisms a tapestry of life-forms all vying for their share of the combined organic mass.

The surface waters, once the sun-soaked playground of the ancient phytoplankton, turned into a feeding ground for herbivorous zooplankton (a myriad of plankton-eating organisms). The herbivorous zooplankton in turn were (and are) preyed upon by *carnivorous* zooplankton such as sea jellies. In the shallows, the kinsmen of the jellies—corals and anemones—are preyed upon by starfish, which are consumed by Harlequin shrimp whose cousins, brine shrimp, are in fact herbivorous zooplankton.

So, the web of life is spun. By *circa* 540 million years ago, the oceans were now dominated by multicellular invertebrates—sponges, worms, molluscs, crustaceans, anemones, and motile species such as swimming shrimp and a variety of jellyfish now called the oceans home. Distribution in the open seas remained determined by the currents, however, as free-swimming locomotion at the time involved pulsating and flapping movements which offered scant resistance to the forces of the ocean.

Among these invertebrates, a small eel-like creature developed a nerve chord along the head-tail axis of its body. A flexible rod of cartilage-like material evolved contiguous to it for support and protection. This rod, in turn, provided anchorage for muscle tissue which improved mobility. Over time, these features would develop into the spinal column, and fish, the first vertebrates, subsequently entered the fray. Lateral thrust, particularly at the tail end, supported by the rigidity of the spine produced forward propulsion that outpaced the best of the invertebrates. Swimming into the currents was now made possible, ensuring the newcomers' dominion of not only the coastal biome but also the open seas.

One would imagine that conditions must have been idyllic for the fish, with slow-moving prey in abun-

dance and slow-moving predators to contend with. Yet these early fish soon (in evolutionary terms) developed protective body armour and bony scales, which are not the kind of adaptations one would expect from an agile vertebrate living in a world of sluggish invertebrates ... unless, of course, we consider that the threat may have come from within their *own* ranks.

Among the land animals, a similar scenario emerges. The reptiles, free to lay their eggs on dry land, entered a world unadulterated by vertebrates. An overabundance of plants and invertebrates was there for the taking, and yet they evolved to produce some of the most formidable terrestrial predators that have ever existed—predators, needless to say, that had developed a taste for fellow reptiles. How did this come about? Was predation a factor among them *before* they entered the interior, or did predation emerge once they were in their new environs? Either situation denotes a level of predatory misconduct.

The mammals come to the fore with the extinction of the dinosaurs. Having eked out a predominantly insectivorous existence in the shadows of their reptilian masters, mammals soon occupied the ecological niches that the dinosaurs had abandoned. Many remained insectivorous, while others adopted a plant-based diet, the earliest of which were the primates and a variety of primitive herbivores known as condylarths. Others, again, like the extinct mesonychids who appeared just after the dinosaurs and the creodonts who preceded the arrival of the true carnivores, took on a predatory role, becoming adept at, among others, hunting fellow mammals. Again, we are led to ask: how closely related was the first mammalian predator to its mammalian prey?

The core of the matter is this: at what level of speciation do the instinctive safeguards inhibiting the consumption of one of your 'own kind' become obsolete? Intra-specific predation (where members of

the same species are involved) is clearly an aberration, with extinction as the ultimate outcome. But is it then admissible for members of a *family* of species, belonging to similar yet separate species, to prey upon one another? Is it acceptable that the leopard seal preys on the pups of crab-eater seals and southern fur seals? Is it acceptable, for that matter, that the killer whale preys upon the calves of baleen whales, which belong to a separate *sub-order*?

The further apart the hunter-prey relationship is, of course, the more advantageous it will be to the family of species concerned. But there is a clear advantage for the perpetrator. Consider the fact that certain octopuses will prey on other octopuses, for instance. Where this occurs, the normally smaller prey species simply has no means of escape. There is literally no hole or crevice that will offer it protection, and even upon exiting the water, the hunter may follow. The most formidable predator that an octopus may be faced with, ironically, is one of its 'own kind'.

There is a similarity among the birds. The development of flight has provided unparalleled protection from terrestrial predators; a timely taking to the skies is all that is needed when faced with danger. Yet these same skies have become the hunting ground of avivores (bird-eating birds) that catch their prey while in flight. Falcons, hawks, and even eagles, to name a few, will target birds for a meal.

The concept of one's 'own kind', from this perspective, implies a broader evolutionary kinship, one which overlaps the distinction of species and genus. The emphasis is on the shared ecological habitat and the mutual benefits derived by its occupants. In this sense, predatory misconduct has a bearing on the established order of a particular *niche*.

To extrapolate, we could say that when the members of a particular niche happen to produce an opportunistic predator from *within* their ranks that chooses to prey

within that niche (like the octopus), then we're dealing with some form of predatory misconduct. Hard-won evolutionary gains are in the balance as a result. We can define such predatory resourcefulness as being *delinquent*.

Predatory delinquency, in other words, pertains to the predatory exploitation of a niche, from within that niche.

How do we rationalise this? What elements of the survival dynamic are at play when, for instance, the leopard seal (who, along with its fellow seals, initially entered the seas in search of marine invertebrates) eventually decides that seal meat is a viable option? Does this bent of the leopard seal imply that there may be a shortage of food in the oceans, or is it simply being opportunistic in response to the behavioural pre-adaptation it has undergone? In other words, has its fish-hunting and penguin-stalking habits simply equipped it with the means and mentality to ultimately consider fellow seals legitimate prey?

The answer may lie in the niche itself.

A niche, in a nutshell, is a position held within the ecosystem that provides maximum survival potential. This would apply across the spectrum of life, from phototrophic algae to apex predators. It's a balancing act, with the availability of nutritional resources on the one hand and the threat of being exterminated on the other. Ideally an abundance of food and a scarcity of predators would be the place to call home, but most creatures are not fortunate enough to find themselves in this situation. To generalise, however, one could say that a niche characteristically provides relative protection from predation. In other words, predator numbers will be low. Paradoxically, this applies to both predator *and* prey. A herbivorous niche, for example, would typically be in short supply of carnivores, implying that conditions are favourable for the herbivores. A carnivore niche, it so happens, would also typically be

in short supply of carnivores, in this case implying a lack of *competition* from other carnivores. In this sense, the herbivorous niche itself can be seen as providing the stimulus for predatory exploitation from within its ranks. The delinquent species, should it turn against its 'own kind' (in the broader sense), effectively overturns the niche in its own favour. And given that it is morphologically well equipped for the task, as we have seen in the example of the octopus, its prospects for survival are excellent.

A hypothetical scenario may serve to elucidate the matter:

The common hippos of Africa are large, semi-aquatic herbivores that can weigh in excess of three tonnes apiece. There is little that disturbs them as far as predators are concerned, and they live a life of reasonable comfort, occupying rivers, lakes, and marshlands across the continent. They forage at night, never too far from the water's edge, and spend the daylight hours lazing in the water, out of reach of terrestrial predators. In all, theirs is a niche enviable to other African vegetarians.

Sharing their habitat are the carnivorous crocodiles that leave them alone, however, for hippos are aggressive and formidable killers, topping the list for human deaths by wild animals. A little-known fact concerning them is that they are inclined to scavenge on the animal carcasses they come across. This is not a common occurrence, but it has been observed in several places across the continent. Let us speculate for a moment how this inclination could evolve.

The taste for scavenged meat could, over time, result in the vying for a share of fresh crocodile kills. With the proceeds of these kills being more readily available than the occasional fortuitous carcass, we could expect to see increasing competition with the crocodiles over the spoils, and along with this an increase in aggression

and the gradual development of a predatory disposition among the hippos. Eventually, we can assume, these hippos would be eyeing every animal that comes down to the waters for a drink as a potential meal. (This is, in fact, not as outlandish as it may seem. Several incidents of hippo carnivory have been observed, the first official account being that of Dr Joseph P. Dudley of the University of Alaska, which involved the killing and devouring of an impala that had been chased into the water by wild dogs.⁹)

At this point, hippo predatory development would find itself at an impasse. Eyeing a meal does not equate to catching it, and the image of a three-ton colossus chasing down a fleet-footed deer doesn't quite fit the narrative. Their 'biomechanical limitations', to paraphrase Dudley above, would restrict their predatory inclinations to within their own habitat, and other than the occasional stranded mammal or perhaps a monitor lizard, the formidable crocodiles would be the only viable source of meat that they could lay their hands on, so to speak ... besides hippos, that is.

Many generations later, we could expect to find two types of hippos on the continent: the common herbivore and a new, aggressive, omnivorous sub-species. It may be that they coexist, or perhaps that the omnivore developed in isolation. Whatever the case, in conclusion, we could envisage that one day, perhaps by chance, one of the omnivorous hippos happens to kill a herbivorous hippo, be it an adult or a juvenile, and subsequently stumbles upon the realisation that it has at its disposal a new source of animal protein in excess. On that day, the face of the African aquatic environment will change forever. The killer hippo would now have an unlimited supply of food (initially anyway), which can't outrun, out-swim, or outsmart it.

The niche that was initially occupied by semi-aquatic herbivores, in other words, would have become a niche for semi-aquatic carnivores.

This hypothetical scenario could reflect an evolutionary timescale of a million years and more, of course. And perhaps several million years later, an alien observer would note that the closest living relative of the semi-aquatic herbivorous hippo is a capable and sleek terrestrial predator that competes with the large cats for its prey. Unbeknownst to the observer, however, this imaginary apex predator sharpened its teeth within its own ecological niche. Predatory delinquency, in other words, provided the schooling ground for its development into a fully-fledged carnivore.

Could the same be said of our existing predators? The leopard seal ticks all the right boxes with its preference for Weddell seals, crab-eater seals, and fur seals. But would this also have been the case with say, the killer whale? What did *it* hunt when it was still a fledgling predator?

Perhaps a closer scrutiny of predatory delinquency would best be served if we focused on some of these 'fledgling' predators.

The central aspect of predatory delinquency, we have seen, is the niche and, in particular, the phenomenon that the niche is susceptible to predation from within. This susceptibility is implied by the natural inclination among members of a particular niche to opportunistically feed higher up on the food chain. A worm-eating sparrow may develop a taste for insects. An insect-eating lizard may develop a taste for frogs. A crab-eating seal may develop a taste for octopuses, and the list goes on. Over time, *fellow members* of the niche may find themselves the object of that same opportunism. If we were to look for tangible signs of *delinquency*, in other words, the approach should be to identify a niche unspoiled by predation, preferably a community of herbivores where one or more of its members have developed an appetite at odds with the

norm ... an appetite perhaps one or two notches up the food chain.

This may seem a tall order. Predation is well established, with tentacles that reach out across the globe into the most unlikely of places—even the skies have not been spared. Fortuitously though, while the animal kingdom has been embroiled in the eons-old struggle for survival on land, plant life has been systematically raising its foliage from the ground, creating, as a result, a wholly new habitat isolated from the goings-on below. Here, in the jungle canopy (which can potentially embrace entire continents), grasping, climbing, and jumping have become the norm, which renders it out of bounds to most terrestrial hunters. The result is that the inhabitants here live a life of relative safety and are also largely herbivores and insectivores, making them the ideal candidates for our enquiry.

The oldest of the inhabitants, the invertebrates, find themselves at the wrong end of the food chain, however, and besides making a meal of one another, are the staple for a variety of vertebrates such as frogs, chameleons, and lizards. These vertebrates, in turn, are the staple of snakes, which also feed on birds and small mammals. The resident mammals again may consume both vertebrates and invertebrates, although by and large most of these species prefer a diet of fruit, nuts, and leaves.

Some unique adaptations were developed here. Lunging from branch to branch has produced a number of gliding, or so-called 'flying' lizards, as well as 'parachuting' frogs that splay their webbed feet when airborne. Even snakes have learned to 'swim' through the air by flattening their bodies. Gliding mammals have developed a membrane between their fore and aft limbs which, when spread-eagled, allows them to travel considerable distances through the air. Some are in fact so adept at this that the next evolutionary step for them would be sustained flight.

Sustained flight, of course, is the grand prize of morphological development, and only two clades of living vertebrates—the birds and the bats—have been able to accomplish this. With their wings, birds have spread far and wide across the globe and today occupy a myriad of different habitats. As many as 18 000 different species may be in existence today,¹⁰ which means that, together with the bats, roughly one-third of all vertebrate species can trace their origins back to the jungle canopy. This goes to show what an advantage the acquisition of flight holds. This advantage, however, is marred by the fact that several bird species have evolved that prey almost exclusively on other birds. Indeed, predatory bird varieties number in their hundreds, and so in our quest for ‘fledgling’ predators, our attention should perhaps be directed elsewhere.

The bats have a lot more to offer in this regard. Technically they’re still arboreal and spend considerable time either foraging or perching in trees. Insofar as their chosen habitat is concerned, however, they are quite unique. Bats hail way back to the beginning of the cretaceous period some 65 million years ago, which makes them relative newcomers when compared to birds, who have an ancestry reaching back to the feathered dinosaurs. As a consequence, bats represent a single order of species, *Chiroptera*, in contrast to (by some estimates) more than thirty orders which constitute the class *Aves*.¹¹ For some reason, bats chose to be nocturnal, be it to evade the talons of feathered predators or in pursuit of nocturnal insects, and they now spend their days in hiding, typically in caves and rocky outcrops (with a few exceptions).

They are at their most vulnerable when emerging in swarms from their roosts. Here they attract a wide range of predators such as cats, canines, weasels, racoons, mongooses, snakes, and even large frogs—not to mention birds of prey—which can all be expected in the vicinity of their colonies at dusk. But relatively few

are caught when considering their numbers, which can run into the hundreds of thousands, particularly when taking into account that the predators involved are by and large being opportunistic, in the hope of catching a low-flying animal or one that may stumble during the exodus.

The only species specialised to feed on bats would seem to be the Bat Hawks of Africa and the East Indies. The beaks of these hawks have a particularly wide gape, allowing them to swallow their prey whole so that they feed on the wing for maximum result. Despite this, the rate of harvest has been estimated at a mere 120 grams of bats an hour (assuming that there is an hour of dusk within which to hunt).¹² And once darkness sets in, the only remaining threat to the bats are owls (which, however, only occasionally take bats) and predators small enough to consider the tiny winged mammals a worthwhile prize and may lie in waiting at predictable feeding places.

It goes without saying that bats have stumbled upon a niche unparalleled among mammals. The night skies are almost devoid of predators, and during the day they remain virtually inaccessible. They are, insofar as our quest for 'fledgling' predators is concerned, the ideal candidates for signs of *delinquency*. With this in mind, we should now consider that while a ten- to twenty-gram bat may be a rather insignificant catch even for a small carnivore (particularly when the wings, legs, and tails are of no use), it would, however, be an attractive meal if the predator happened to be another bat. Accordingly, our attention should now be directed towards those species that are at odds with the norm.

Most bats are insectivorous, although many species specialise in eating fruit, nectar, and in the case of the vampire bats, blood, which is lapped up after a bite is made on another animal. Being flying animals, the quantity of food eaten is directly related to their size, so it stands to reason that, where the insectivores are

concerned, larger bats will target larger prey. Candidacy for *delinquency* should therefore include those species that are large enough to prey not only on large insects but potentially on small vertebrates as well.

There are three families of species that qualify: False Vampire Bats, Slit-faced Bats, and New World Leaf-nosed Bats, which all occur around the tropics of the world. They are known to feed on birds, mice, lizards, and frogs and are morphologically the best equipped among the bats for the task. Professor M. Brock Fenton, who has been studying bats since 1963 in many parts of the world, in his book *Bats* (which founder and director of Bat Conservation International Merlin D. Tuttle considers "... the most complete summary of knowledge about bats yet available") sums up these three families of species as follows:

All of these bats have four things in common. First, they are large, the smallest weighing at least 20g, and the largest, Linnaeus' False Vampire Bat and the Ghost Bats, over 100g. Second, they have broad wings. Size and wing shape well equip these bats to catch and kill larger prey and carry them off to a feeding perch. Third, these bats all use their vision or sounds made by their prey to find vulnerable targets. Fourth, they all eat arthropods as well as small terrestrial vertebrates.¹³

Their pre-adaptation, as regards the potential to take advantage of their own niche, is substantial. Significantly, sight rather than echolocation is used for identifying prey, implying that stealth is predominant. Being larger than the norm gives them an advantage as far as strength is concerned, and then of course the fact that not only arthropods but also small vertebrates are eaten predisposes them to *delinquency*.

It should come as no surprise, therefore, that Brock Fenton also tells us the following:

Perhaps the most intriguing predators of bats are bats themselves. There are species of bat-eating bats in three families: False Vampire Bats, Slit-faced Bats and New World Leaf-nosed Bats. In Australia, the Ghost Bat often preys on other species of bats, as do Indian False Vampire Bats and Heart-nosed Bats, the former from India and Southeast Asia, the latter from East Africa. These bats are all False Vampires. Large Slit-faced Bats, another African species, prey on bats, as do Linnaeus' False Vampire Bats and Woolly False Vampire Bats of the Neotropics.

Wherever bat-eating bats occur, the victims are always smaller species. In captivity, bat-eating bats use flight sounds and vocalisations to detect their targets. Other bats are grabbed in the predator's mouth and killed with a powerful bite to the back of the head. The prey is usually eaten from the head down, and the wings, flight membranes, legs and tail are usually dropped uneaten. When the prey consists of other species of slit-faced bats, Large Slit-faced Bats also bite off the large ears.¹⁴

The night skies are clearly no longer the refuge they were intended to be for bats. These 'fledgling' predators, for now part insectivore and part carnivore, are turning the habitat into a niche for carnivorous bats. Defensive behaviour is already apparent among some prey species. The Short-tailed Fruit Bats, for instance, avoid flying in bright moonlight and don't eat their meals where they grow but carry them off to eat elsewhere, presumably to minimise exposure to one of their 'own kind'—probably the Linnaeus' False Vampire Bat and the Woolly False Vampire Bat, according to Brock Fenton.¹⁵

The bat niche is, in effect, in a slow process of self-destruction. Given time, even their subterranean strongholds could become hunting grounds (which they may already be). And as these predatory species become more accomplished, prey larger than the tiny bats may be selected, to the extent that carnivorous bats could one day compete with the nocturnal birds of prey. Indeed, in the long run, bats could potentially become diurnal hunters that compete with the raptors.

That having been said, our investigation should now focus on the wholly arboreal inhabitants of the jungle canopy—those who have not taken to wing. The dominant order here, the primates, are predominantly herbivores and insectivores after all, and the environment they share is also virtually devoid of predators ... at least, predators large enough to consider them prey. As we have seen, these are the conditions conducive to predatory opportunism.

Two suborders of primates are recognised that can be loosely described as 'lemur-like' and 'monkey-like'. The former are the more primitive of the two insofar as arboreal traits are concerned and are generally also of smaller stature. The 'monkey-like' primates include the New-World monkeys from South America and the Old-World monkeys that inhabit Africa and Eurasia. Among the latter are included the world's larger species (the baboons and the great apes) which, given their physical advantage over smaller primates, makes them the preferred subject matter.

The largest of these, the gorillas, are, however, true vegetarians, but may also include grubs and snails in their diets. The orangutans eat mainly fruit but will also eat leaves, bark, termites, and the occasional bird's egg. The macaques—the Asian relatives of the baboons—generally eat leafy vegetation but will include grains and insects in their diet, with one species, the long-tailed macaque, specialising in clams and crabs.

Chimpanzees and baboons, in contrast, display behaviour and eating habits strikingly different.

Baboons, for example, hold the singular distinction among primates (besides man) for having held a bounty on their heads. In the early years of the twentieth century, the government of South Africa, in an attempt to improve agricultural conditions, offered a reward of ten shillings for every baboon killed. This must have had a considerable effect on their numbers, but farmers protecting their crops decimated them regardless, but not only crops were affected. Faced with hunger brought on by the encroachment of Man, baboons resorted to killing lambs to get to the curdled milk in their stomachs. This led to the eating of the slaughtered lambs in some areas and eventually the capture of lambs solely for the purpose. The pioneering ethologist, Eugene Marais, commented at the time:

The meat-eating habits of baboons in the Suikerbosrand appear to be fast spreading in other directions. A short while ago they discovered that the full-grown sheep makes as satisfactory a victim as the helpless lamb, so they now slaughter large sheep; but not only sheep, but pigs, ducks, fowls, guinea-fowls, and turkeys are already on the list of their booty in the Suikerbosrand.¹⁶

The living conditions of baboons at the time, while roaming wild, were hardly natural, and this now obsolete behaviour can perhaps be ascribed to baboon opportunism rather than their feeding preferences. Marais, who had the rare opportunity to study baboons under near pristine conditions before the encroachment of the modern world, was in fact of the opinion that baboons have a natural aversion to meat. In his three-year study of a 300-strong troop, as recorded in *My Friends the Baboons*, not one attempt was made to

catch an animal, although there was “ample opportunity to do so”. The closest his baboons came to antagonistic behaviour was to frighten sleeping rabbits they came across by jumping between them from a height. On the only occasion observed where a young rock-hare was taken, the female responsible treated it like a child, protecting it from the curious touches of the other baboons. When it finally died of starvation, the female mourned for several days. Notably also, the carcass was left alone.

It is arguably the opportunism of baboons that sets them apart from other primates. Despite man’s relentless war against them, they remain one of the most resilient and widely distributed species across Africa. And while Marais himself may never have observed carnivorous behaviour among them, it is now undisputed that they have taken to hunting in certain areas.

Dr Shirley C. Strum, a biological anthropologist specialising in primate studies, made some interesting observations in the early years of her thirty-year-long research on olive baboons in Kenya. The 45 000-acre cattle ranch that was home to her chosen troop at the time was also home to a variety of other wildlife, including the Thompson’s gazelle. The fawn of these gazelle she discovered, to her horror, were a sought-after delicacy among her baboons. She describes her first encounter as follows:

A grisly scene greeted me. Sumner sat in the middle, a squirming baby Thompson’s gazelle in his mouth. He had it by the neck, its head near his mouth, its legs flapping. The next minute, the tommy was pinned to the ground, front and rear legs held down by strong baboon arms. Sumner was eating from the soft underbelly while the baby was still alive. It did not die until five minutes later; there was no quick killing bite. Eating proceeded quietly.¹⁷

The capture of a gazelle fawn on the ranch was always accompanied by huge excitement. Every member of the troop who happened to be in the vicinity of the kill would vie for a share of the prize, but as the right to possession is a fundamental rule among baboons, the others, in order of dominance, would wait patiently for the leftovers.

It was typically the males that took to hunting, learning to identify the herds with young; the females, despite a keen interest in meat, would stay behind with the troop. As time went by, the males became more proficient, and with increasing frequency, Strum observed them hunting in relay, one taking over the chase from another. In 1973, a hundred kills were noted in a period of twelve hundred hours of observation. In Strum's opinion, the predatory activity may have been sparked by competition among certain males, and this sophisticated form of hunting eventually petered out as those involved migrated to other troops.

Baboons spend much of their time foraging on the ground and are quite likely to stumble upon small animals lying in hiding, so it is not surprising that carnivorous behaviour has been observed among them in other places as well. Curiously though, at certain locations, they face stiff competition from another primate species. In the Gombe National Park in Tanzania, where bushbuck fawn are typically targeted as prey, the screams and barks that accompany a kill invariably attract the keen attention of chimpanzees in the vicinity. And while baboons may harass one another when a kill is made, chimpanzees can put up a huge fight for the spoils. These altercations, which were observed by Jane Goodall who studied the resident chimps for thirty years, are notably violent, and physical confrontation involving the use of canines is not unusual.

When compared to baboons, however, chimpanzees are by far the more sophisticated predators. Research has shown that no less than forty different vertebrate animals have been recorded on their menu. They will eat gazelle, lizards, birds, pigs, rodents, and frogs—virtually anything that they can lay their hands on, it would seem.¹⁸ It comes as no surprise, therefore, that primates also feature prominently.

Where the predatory inclination of baboons is directed exclusively towards terrestrial animals and may even be ascribed to opportunism, chimpanzees, in contrast, are selective hunters, giving particular attention to arboreal species. At Gombe, for instance, Goodall's observations revealed that between 1990 and 1995, red Colobus monkeys accounted for more than eighty percent of their meat intake.¹⁹ In fact, they had become so accomplished in the pursuit of animal protein that in peak seasons they could approximate the meat intake of some human societies in leaner months.²⁰

Just how chimpanzees have taken advantage of the arboreal niche for their own predatory ends is illustrated by the following eyewitness account of Dr Goodall's:

Once, ... six male chimpanzees, travelling in the south of their range, came upon a female baboon with a very small infant feeding, quite by herself, in a palm tree. She was not a member of any of our study groups and we did not know her by name. Figan, who was in the lead, grinned when he saw her, squeaked softly, and reached out to touch Satan. All six males stood gazing up, their hair bristling. When the baboon noticed them she stopped feeding and, almost at once, began to show signs of distress, giving soft fear calls and backing away to the other side of the palm. Jomeo, moving slowly, climbed a tree close to her palm until he was

level with the baboon and about five yards away. As he stopped and stared at her she began to scream loudly, but apparently no other baboons were within earshot. Certainly none appeared, then or later.

After a tense two minutes, Figan and Sherry climbed deliberately into two other trees. One hunter was now stationed in each of the trees to which their victim could leap. The other three chimpanzees waited on the ground. Suddenly Jomeo leaped over into the baboon's palm. The baboon made a huge jump into Figan's tree. It was easy for him to seize her and pull away the tiny baby. He killed it with a quick bite into its head. And then, as the mother watched and called out hopelessly from a neighbouring tree, the six hunters shared the carcass.²¹

Only a primate could have executed this hunt with such efficiency. In a classical display of the reward evolution bestows on the delinquent predator, the chimps had masterfully outplayed the baboon on her own territorial terms. There was simply no escape. And by no means is this an isolated incident, but rather the *modus operandi* of chimpanzee predation observed across the continent where pockets of them still survive. The same pattern even emerged among a troop of *orphaned* chimps in the Gambia, western Africa, where in the late 1960s Stella Brewer started a sanctuary for infant and juvenile chimpanzees. The eldest, Tina, had been removed from the wild at the age of six, Cheetah and Albert at the age of four, and five others as infants. On their daily walks through the Abuko Nature Reserve with Stella, the young chimps would playfully chase colobus monkeys, until eventually one was killed and the game took on a distinct seriousness. The following incident occurred a year or so after their arrival at the sanctuary:

To begin with, chasing the Colobus was a haphazard affair. Although all the chimps joined in, I could see little co-ordination amongst them; it was more a matter of each chimp for itself. Success was a matter of luck rather than the result of strategic hunting. The more practice they had, though, the more co-ordinated they seemed to become. I once watched Tina chase a Colobus until it made a tremendous leap into the crown of an isolated oil palm. Cheetah was close to Tina and remained on the branch from which the Colobus had leapt, while Tina back-tracked and scrambled quickly to the ground. This blocked the only possible aerial escape route. Albert was already at the base of the oil palm when Tina arrived but remained sitting there and allowed Tina to climb. William stood a few yards behind Albert and watched Tina's progress. As she neared her prey all the chimps began to 'whaa' excitedly, yet remained in more or less the same position.

Tina quickly closed the distance between herself and the terrified monkey but at the last moment the Colobus leapt to the tip of a palm frond which sank beneath his weight, then made a thirty-foot drop into a tangle of low bushes below. Albert and William were waiting however, and between them they caught the Colobus. Tina, Cheetah and the four younger chimps soon joined them.²²

Such parallel behaviour among a troop of orphaned juveniles at the opposite end of the continent is extraordinary and begs the question of the deep-rootedness of the phenomenon. The three older chimps may well have witnessed similar events before their removal from the wild (although juveniles as a rule don't partake in hunting), which will go a long way in explaining the similarity, but one is nonetheless left

with the suspicion that instinctive impulses could have been involved. Would the same behaviour have been exhibited if the troop consisted entirely of individuals that had never known the wild?

Stella's account of her very first observed kill is of interest in this regard, particularly when considering the behaviour of the five younger chimps which had all arrived at the sanctuary as infants. Pooh, in fact, had been raised as human child, complete with cradle, high-chair and diapers:

One morning Tina, Cheetah and Albert were in the lead [the older chimps], William followed with Happy, while Flint, Ann and Pooh were walking beside me. I saw Tina suddenly leap forward and run into some dense undergrowth, followed closely by Cheetah and Albert. There was much rustling of dry leaves and I thought the chimps were chasing a pack of mongooses. The sudden high squeaking seemed to confirm this, till I heard an outburst of loud excited screaming coming from the hidden chimps. William raced forward and all the chimps followed. As I crawled through the tangle of thick vegetation to where they were, I thought they were having an almighty fight; everyone was screaming hysterically and seeming to dive in and bite or pull at Tina's stomach. As I approached, Tina leapt clear and ran, still screaming, into a small tree. All the others were still very excited and one or two of them embraced each other, then hooted and barked again with renewed vigour. I couldn't understand the frenzy till I saw that Tina held in one of her hands a very young Green Vervet Monkey that was still alive and squeaking. I stood paralysed for a moment, then ran to Tina's tree. This caused a renewed explosion of noise from the rest of the chimps and Cheetah began to climb towards Tina.

I asked her in a shaky voice to give me the baby monkey and held out my hand. Again the screams and ‘whaaas’ rose to a crescendo. I couldn’t understand why, but clearly they were intent on harming the monkey. I had raised and looked after several Vervets and found them loving little creatures; that this mob should want to hurt one so small and helpless was unbearable. I had to rescue that infant. I ordered Tina again to drop the monkey and flung a small branch at her – she climbed higher, still uncontrollably excited, then brought the monkey to her mouth, and bit into its head, ripping off an ear. The squeaking stopped and Tina began to bite and eat.

I couldn’t watch. Feeling thoroughly sick, I fled back to the path. The younger chimps followed but I wanted nothing to do with them. Even Pooh had been trying to grab and bite at the monkey, and when he took my hand it was all I could do to let him hold it.²³

Whether this behaviour is biologically imprinted or not remains to be seen, but we are nonetheless left with little doubt that monkeys can expect no sympathy from their chimpanzee cousins. What does seem to be a common denominator, however, is the fact that infants are invariably targeted. At Gombe, for instance, an estimated seventy-five percent of colobus killed are juveniles and infants.²⁴ Obviously the adults are more formidable to deal with, and nursing mothers have a harder time getting away, so this comes as no surprise. But there is an underlying sinisterism in chimpanzee infanticidal behaviour that begs further inquiry and which may shed some light on what could well have been the catalyst that induced their delinquent appetite.

Infanticide is not uncommon in nature. Male lions that take control of female prides are known to kill the

cubs of the deposed leader. There are obvious advantages to this. With the removal of each cub, the new male not only reduces the genes of his competitor but increases his own, as the females will promptly become sexually receptive again and, in turn, bear his own offspring.

This form of reproductive competition among males is found in species as disparate as the poison-arrow frog (which will eat the fertilised eggs of a rival male) and the common house mouse. Certain monkeys such as the Hanuman langurs and, in isolated cases, baboons are known to do the same. Among the mountain gorillas that Dian Fossey studied for eighteen years, the practice had become an integral part of their social lives.

Gorillas move about in small bands dominated by a single male that generally has absolute mating rights with the females. Younger, subordinate males are tolerated and may, in cases, even sire offspring, but normally they will leave their natal group upon reaching maturity to establish their own individual harems.

Initially, these young males become what Dr Fossey calls 'peripheral silverbacks' who will keep within proximity of the group, but they later become 'lone silverbacks' and travel about in search of females of their own. Because the females are usually all spoken for, harem masters are under constant threat of attack by these lone males. Just how violent these interactions can be is evident from the skeletal remains of sixty-four specimens Fossey collected in the area, seventy-four percent of which had signs of healed head wounds and eighty percent either missing or broken canines. Embedded in two of the skulls, Fossey discovered canine cusps broken off from the teeth of other silverbacks.²⁵

Typically, lone silverbacks will attack an entire group, biting, it seems indiscriminately, both males and females. Infants unfortunate enough to end up in their clutches are instantly killed. The ultimate objective is

no doubt the killing, maiming, or banishment of the harem master, but many of these confrontations are likely tests of strength for the lesser-experienced male, and if in the process he can reduce the number of offspring of his rival, so much the better. Some of these attacks may be attempts to isolate a female from the group and others simply acts of bravado designed to impress upon the females the masculinity of the aggressor and his potential as a future mate. Constant harassment by a lone silverback may even influence certain females to join him rather than being at the receiving end—particularly those who have lost their young (possibly at the hands of the same silverback) and no longer have strong ties with the group.

Female migration between groups is commonplace. The males seldom contest these movements, with the result that a female may transfer from one group to the next in search of favourable conditions. Once these conditions have been met, however, they tend to bond for life with their chosen silverback. With the relocations of these females, infanticide comes to the fore as integral to the reproductive potential of the males. A new female may be accepted into a group, but her infant will be promptly killed, ensuring her speedy return to fertility for the leader's benefit. With the death of a harem leader and the subsequent takeover by another silverback, the same pattern emerges. A brief overview of Fossey's 'Group 4' will serve to illustrate these social complexities:

Group 4, when the initial study began in 1967, consisted of fourteen members, including, besides the ruling silverback Whinny, a twenty-five-year-old male, Amok, and the fourteen-year-old male 'Uncle Bert', respectively thought to be brother and son to the leader. The female hierarchy consisted of three mature females: Old Goat, Flossie, and Mrs X, and four

younger females: Bravado, Maisie, Petula and Macho, who were nearing sexual maturity.

At the time of Whinny's natural death, six months into observation, Amok was travelling peripherally, and group leadership was taken over by the inexperienced Uncle Bert. Coinciding with the takeover, Flossie's seven-month-old infant mysteriously disappeared—a suspected victim of infanticide. Amok later tried to return, received a serious bite to the neck from Uncle Bert, and was never again seen mixing with the group.

Young Uncle Bert now became a frequent target for intergroup interactions, inexperienced as he was in protecting his harem. Bravado moved over to Group 5, where she lost her first offspring during an attack by a lone silverback. Mrs X joined Amok, returned after two months, and then disappeared, never to be seen again. Bachelor Group 8 then attacked, taking along with them Maisie and Macho. By 1971, within some four years, Group 4 had been reduced to Uncle Bert and three females.

In 1974, Uncle Bert regained Maisie, who, however, ended up settling down with a lone silverback named Samson. The death of the leader of Group 8 then followed, and Uncle Bert regained Macho, promptly killing her 9-month-old infant, Thor. A month later, Petula, who had remained with Group 4 all this time, joined the lone silverback, Nunkie, taking a young female along with her. Group 8 then attacked, trying to regain Macho, but after a violent confrontation, they were driven off, leaving behind the young male Beetsme, who became part of Uncle Bert's group.

Then the unexpected occurred. First Digit, the second-oldest male of Group 4, and later Uncle Bert and Macho were killed by poachers. The group now came to rely on ten-year-old Tiger, sired by the late Whinny, for leadership, but Beetsme, his senior by two years, had other ideas, killing Uncle Bert's last offspring, the six-week-old Frito. A week later, Flossie (the mother)

emigrated, taking two young females along with her. The last remaining female left Group 4 months later with her six-month-old daughter, who subsequently also became a victim of infanticide.

And so, Group 4 came to an end. The remaining three males eventually joined up with other males to form a new bachelor group.²⁶

This brief overview is as tragic as it is of interest and raises the issue of the viability of gorilla reproductive strategies. Curiously enough, besides the confirmed cases of infanticide recorded, an additional number of infants simply disappeared, their bodies never to be found. In these cases, the tell-tale signs of violent interaction were also absent, which confounded the matter.

With the disappearance of six-month-old Banjo of Group 5, for instance, Fossey and her team scoured the surrounding area where the group had ranged for days, finding no sign of the infant or any indication that another social unit had been encountered. The only signs of violence they did come across were attributable to quarrels within the group. Determined “not to leave the mystery of another infant disappearance unsolved,” however, Fossey then proceeded with the unenviable task of sifting through individual dung deposits and subsequently discovered teeth and slivers of bone in the dung of the dominant female Effie and her eight-year-old daughter, Puck. This came as a surprise, for gorillas are strict vegetarians. Extensive dung analysis of free-living gorillas had not produced anything remotely resembling bone, and so to use Fossey’s own words, it seemed “much too coincidental that Banjo could vanish and bone fragments could appear simultaneously in the dung of two members of her group.”²⁷

These were the days before DNA analysis became available, unfortunately, and so the anomaly remained unresolved. Fossey’s insistence that this was “much too

coincidental," however, suggests that there must be some aspect of gorilla social interaction that can provide an explanation. In this regard, the procreating strategies of *female* gorillas bear consideration.

Unlike male rivalry which typically takes place between different groups, females specifically compete *within* the group. And while male rivalry may be openly displayed, quite the opposite applies with the females. Hostility towards the offspring of a rival female, for example, equates to hostility towards the offspring of the male, with dire consequences for those involved. Female competition then, for obvious reasons, is practiced surreptitiously.

As a rule, the rank order of female gorillas corresponds to their order of acquisition by the leading male (as with polygamous human societies, as a matter of interest). The first 'wife', as it were, generally remains the dominant female despite changing circumstances. Lower ranking females typically occupy the fringes of the group and are denied access to the inner circle of the silverback by the dominant female and her offspring. In some instances, an ostracised female may be totally ignored by the male despite sexual receptivity, in which case her emigration becomes likely. How her rivals are able to accomplish this is unclear, but the victory is undoubtedly theirs.

With the birth of an infant, however, low ranking females, by virtue of the silverback's paternal interest in his offspring, gain access to the jealously guarded inner circle, and higher-ranking females can subsequently be found at the periphery. Close proximity to the silverback, besides guaranteeing his attention when in oestrus, also implies his physical protection, particularly when the group is attacked by rival males, and so it comes as no surprise that the antagonism towards a lower ranking female increases when she becomes a new mother.

Let us take a look at some of the intricacies involved:

In 1973 Group 5, with Beethoven as the ruling silverback, consisted of the matriarch Effie, second ranking Marchessa, and lower ranking Liza. Bravado, originally of Group 4, had spent roughly a year with them, but never became an integral part of the group, despite having borne Beethoven a son. With the death of her infant (by a lone silverback, emphasising the advantages of being in close proximity to the patriarch), she finally emigrated, taking along with her an eight-year-old female.

Effie's position as matriarch was well established. Besides two female offspring at the time, she was also mother to the group's second-oldest male, eleven-year-old Icarus, who understandably had her interests at heart. And as the highest-ranking female, she also maintained closest proximity to Beethoven.

The second matriarchal clan within the group was headed by Marchessa and consisted of one young female called Pansy, and a younger male. Liza, the lowest ranking, had only a three-year-old daughter. However, when a year later she bore Beethoven a son, her status within the group immediately increased, and she was consequently often seen grooming the silverback. Marchessa as a result had effectively become the lowest ranking female and was now also commonly found at the perimeter with her offspring.

The following year was Pansy's turn to give birth, but instead of seeking the attentions of the silverback, she uncharacteristically withdrew from the group to 'cling unobtrusively' to the edge near her mother, Marchessa. Three months later, Marchessa herself gave birth, which would normally have meant a considerable improvement in status for the two females (and detriment to their rivals) but instead, Marchessa's infant conveniently disappeared.

Effie and her brood now became increasingly antagonistic towards Pansy and *her* infant, named Banjo. The

patriarch Beethoven, meanwhile, had been seriously injured in an attack with a rival group and often lagged behind, which afforded the young male Icarus, along with his mother Effie and her daughters Puck and Tuck, the opportunity to intimidate the young Pansy. At six months old, despite the combined efforts of both Pansy and Marchessa, Banjo also mysteriously disappeared. Interestingly, Effie gave birth three days after his disappearance.

Pansy then returned to cyclicity, and this time it was Icarus who showed sexual interest towards her. With this enhanced status, Pansy spent more time adjacent to Effie's clan, although gingerly avoiding direct body contact with any of them (besides Icarus, of course). Three months before bearing his child, however, she was again seen bringing up the rear of the group with her mother, the right side of her face badly injured.

With the birth of Pansy's second child (and Effie's first grandchild), only days after another delivery by Marchessa, the two females' fortunes finally changed. Liza's proximity to Beethoven came to an end, resulting in her eventual emigration, and Effie was seen spending more time at the fringe of the group.²⁸

This rivalry obviously goes a long way in explaining the movement of females between groups, but could it also be the reason for the infant disappearances recorded over many years of observation? In light of the advantages such disappearances would have held for certain females, it's not unreasonable to consider that they may have been done away with. But what could have become of them? Despite extensive effort on the part of Fossey and her team, not a trace of their bodies was ever found ... except, of course, the traces of bone in the dung of Effie and her daughter Puck immediately after the disappearance of Banjo. Are we then to deduce from this that Banjo may have been *consumed* by his mother's rivals?

Among the chimpanzees of Gombe, Jane Goodall also noted several infant disappearances, and her observations in this regard provide valuable insight into the phenomenon, particularly since the two species are so closely related.

Goodall and her team were all delighted when, in 1974, the female Gilka gave birth to her first infant, Gandalf. Being a loner, lame in one hand as a result of polio, and with a disfigured face due to a fungus infection (and having recently lost her mother), the birth of Gandalf meant that Gilka would no longer be alone:

Moreover, the birth of a female's first baby often seems to induce an added respect for its mother among the other members of a community, male and female alike. It was wonderful to see Gilka, who had so often sat on the outskirts of any grooming or resting group, at last taking a more active part in community life.²⁹

At six weeks old, however, Gandalf mysteriously disappeared, and Gilka once again wandered about on her own. The following year, she gave birth to a second child, this time a female named Otta, whose life unfortunately was cut short by one of the dominant females called Passion. The 'disappearance' of this infant, however, *was* witnessed:

Gilka, we were told, was sitting peacefully in the afternoon sun, cradling her tiny infant, when Passion suddenly appeared. She stood for a moment, looking at mother and child—then charged towards them, hair bristling. Gilka fled, screaming, but she was doubly handicapped—with an infant to support and a crippled wrist. In a flash she was overtaken. Passion leapt upon her and seized hold of little Otta. Then, most macabre of all, she pressed the stolen baby to

her breast, and Otta clung there desperately while Passion again leapt on Gilka. At this moment, Pom, an adolescent at the time, rushed to join her mother, and Gilka, outnumbered, turned and fled with Passion in hot pursuit, Otta still clinging tightly to her belly. Confident in her victory, Passion sat on the ground, pulled the terrified infant from her breast, and bit deeply into the front of the little head: death was instantaneous. Slowly, with utmost caution, Gilka returned. When she was close enough to see the limp and bleeding corpse she gave a single loud, bark-like sound – of horror? despair? – then turned and left.

For the next five hours, Passion fed on Gilka's baby, sharing the flesh with her family, Pom and juvenile Prof. Between them they consumed it all, every last scrap.³⁰

The discovery of bone fragments in the stools of two female gorillas along with the disappearance of Banjo and the parallel 'disappearance' of Otta into the stomachs of Passion and Pom (and Prof) does seem to be 'too much of a coincidence'. Several infants, in fact, disappeared under Goodall's watch, just as they had among Fossey's gorillas. What are we to make of this? Were the chimpanzees, given their proclivity towards animal protein, being opportunistically predacious? If so, then how do we explain the similarity among their vegetarian cousins? A more reasonable approach might be that this form of infanticide, rather than *having* a predatory bias, may have *induced* a predatory bias. In other words, we may be dealing with the root cause of the predatory inclination among chimpanzees. Not only are the females in this way exposed to animal protein; juvenile males such as Prof, who are still in their mothers' care, also get to share in the spoils. A taste for meat in such cases could arguably persist into adulthood.

A telling incident was observed in the Mahele Mountains National Park in Tanzania, where a newly born infant was snatched by an adult male called Darwin immediately after delivery:

When we located Darwin again sitting [in] a tree at a height of approximately 15m at 12:57, he had already started eating the infant from the lower half of its body. Darwin ate the infant alone on a branch, whereas some adult females and adolescent males were observing Darwin [from] the same tree, several to 10 m away.

Between 13:32 and 13:38, Xantip, an adult female, and Azam, an adolescent male, picked up and ate some pieces of meat or bones falling from the branch where Darwin was positioned. An adolescent female, Genie, approached Darwin and tore a small piece of meat from the body of the infant held by Darwin; however, he showed no reaction.³¹

Researchers from Kyoto University, Japan, who witnessed the incident established through the analysis of twenty-one years of sighting data that the Mahele chimps display a ‘maternity interval’ during which a mother may isolate herself when giving birth. It is “particularly important for a mother to be spatially situated away from males around the time of delivery” they argue, citing similar occurrences in the past.³² Indeed, Jane Goodall initially set up camp at Gombe a safe distance from the chimpanzees, fearing for her own infant son’s safety; such is the reputation of the chimps.

Whatever it may be that induced this penchant in the chimpanzees, the taste for meat is now well established. Their predilection for infants, however, would suggest that they are still in the early days of a predatory transition and that, despite their prowess and aggression, are

in fact still ‘fledgling’ predators and learning as they go along.

They would do well to take a page from the book of the bipedal apes—their closest living relatives—who have become the most formidable of predators ... and may once have led an existence very similar to their own.

3

EDEN'S MALCONTENTS

There are many halls in the king's palace, and intricate keys open the doors, but the axe is stronger than all of these, and no bolt can withstand it. —Martin Buber (Tales of the Hassidim)

Nature does not share her treasures idly. Like some boorish tyrant, she clings to her wealth, rewarding only piecemeal her most ardent supporters—those totally dedicated to surviving.

A gazelle fawn that, only hours after shaking its startled head for the first time, evades the attention of a hungry carnivore with deft darts and turns does so by the grace of the thousands of generations that preceded it, through the accumulated talents of aeons of struggle against life's adversities.

Nothing is handed out lightly. The fleet-footedness of a deer, the cunning of a fox, the intelligence of man—these have been earned, have been wrung from nature's selfish heart with each anguished cry, each heart-pounding crisis, and every searing, lingering breath.

The reward is not merely that we live but that we have acquired the means to continue doing so.

Whence, therefore, do qualities such as love and compassion come? We know from the warm-blooded animals that emotional bonds keep groups together, that the group, struggling in unison, has greater potential

than the lone individual. But at what price comes a compassion that would rescue a helpless, drowning insect? Or a love that would willingly give up life for the sake of another? What have we humans had to endure?

These eyes of ours must have beheld more than we dare to imagine. The memories, however, would have been compressed—reduced to instinctive impulses that we call upon only on demand. And so, the only knowledge that we have of our remote existence is that which can be gleaned from the litter that was left behind ... clues to our past that are however subject to the interpretation of prevailing academic bias.

At the very dawn of evolutionary theory, Darwin, who had arguably peered into the heart of the philosophy with greater cognisance than any of its champions, held the view that our human attributes had evolved together as individual parts of a single evolutionary package. Essentially, man had developed differently from the apes because he had become a hunter. “If it be an advantage to man,” he wrote in *Descent of Man*, “to have his hands and arms free and to stand firmly on his feet, of which there can be no doubt from his pre-eminent success in the battle for life, then I can see no reason why it should not have been advantageous to the progenitors of man to have become more erect or bipedal. They would thus have been better able to defend themselves with stones or clubs, or to attack their prey, or otherwise obtain food.”¹

This view held sway well into the twentieth century, and hunting was seen as the key activity, the formative force in human evolution. Hunting favoured an upright posture, necessitated the use of tools (weapons), developed the cognitive skills, encouraged co-operation (and hence probably the use of language), prompted the complexities of human social behaviour, and, in all, induced the most explicit of our attributes: the expansion of the human brain. As Raymond Dart once

put it, "Man's erect posture is the concrete expression of the single success of this type of life. It emerged through and was consolidated by the defensive and offensive stone-throwing and club-swinging technique necessitated by attacking and killing prey from the standing position." "This purposive industrial specialisation of the hands in accurate hitting and throwing," he added, "was the only persistent stimulus capable of transferring the body weight from the clambering knuckles."²

Perspectives do change, however, and this generally acclaimed 'hunting hypothesis' came over time to be seen as 'human-oriented'—the interpretation of evidence from a typically male point of view—and as such, it became the 'anthropological fantasy' of an earlier generation. Emerging evidence indicated that bipedalism predated the development of stone tools (generally acknowledged as the genesis of tool usage), and on this basis, Richard Leakey, for instance, declared, "Of one thing we can therefore be certain: the Darwinian package of bipedalism, tool making, and intelligence marching in evolutionary concert is not correct."³

'Hitting and throwing', in other words, was not necessarily the stimulus that encouraged us to stand upright, and so the image of a weapon-wielding ape was gradually dissolved, and in its place was seen a more moderate species, less aggressive and less intelligent—one whose primary distinction from the other apes lay in the fact that it walked about on two legs. It made more sense that the *posture* would have provided the stimulus for the eventual use of tools and not vice versa, with the hunting episode probably appearing much later in the evolutionary timetable—around 2.5 million years ago being most likely, when the first pebble tools arrived on the scene.

This new view, of course, required its supportive arguments. The increasing number of different fossil

hominids being discovered indicated that the bipedal lineage was burgeoning at a time when arboreal species were declining in number, and as the crafting of stone tools and the associated hunting lifestyle could no longer be seen as having been instrumental in these early advances, there had to be another credible explanation. Somehow, the *stance* must have given man the leading edge, and the most plausible rationale in this regard lay in the freeing of the hands, which, as a consequence, meant that things could be carried about. This suggested that man's primary advantage lay in his ability to gather what was needed, and as a gatherer, he would have learned to share—a largely untapped leverage outside of the insect kingdom. This, in turn, implied the establishment of home bases and the division of labour, as evidenced by modern hunter-gatherer societies.

This interpretation provided a viable new perspective on human development. The uniqueness of our species could now be coupled to an adaptation that was equally unique among mammals. Certainly, animals such as rodents are inclined to gather food, and certain carnivores will tolerate a level of sharing, but gathering and sharing had seemingly become man's speciality, which furthermore extended beyond the parameters of the immediate family to include the members of extensive groups. Not only were the limitations of individual foraging thus surpassed, but a new dimension was added to mammalian social complexities—among humans, the individual would increasingly become a mere element of the group dynamic, a cog in the wheel of group evolution. Intelligent life had entered, if you will, the ranks of the social elite such as ants and bees, and the advantages of this adaptation appeared self-evident in the dominant role man plays in nature.

And so, food sharing became the principal differentiator between the apes and the human clade. The focus

was now on social interaction. Group economic interdependence, with its division of labour and other reciprocal arrangements, would have encouraged an increase in intelligence. Reproductive capacity would have benefited if females were provided with sustenance while parenting. Leaving loved ones in the care of others while searching for food in turn required strong bonds and the rudiments of morality. Cooperation, intensified at all levels, would have promoted communication and thus the development of language. In short, the food-sharing hypothesis integrated so many aspects of our behaviour that it provided an almost complete picture of human development.

This left the hunting factor as largely irrelevant to our prehistory. To wit, our predatory legacy was now under question, as it made more sense for a gathering ape to have specialised in scavenging. The litter suggestive of early hunter-gatherer base camps was consequently re-scrutinised until it became apparent that the collection of bones found at such sites typified the remains of animals that had been left out in the *veldt* after carnivores had had their fill. Early man was thus more likely the rather ignoble collector of long bones and skulls from which the marrow and brain could be extracted.

The scavenging scenario opened up a whole new debate. Marrow, which is a high-energy food source, would have been quite readily available to any animal able to crack open the thick bones left behind after a kill, and a rock in the hands of an omnivorous, terrestrial ape could do just that. The idea that stone tool usage was indicative of the advent of hunting was thus not necessarily correct. Scavenging furthermore places a higher premium on intelligence than hunting. Where the hunter typically matches his wits against a herbivore, the scavenger does so against a predator, getting to know its more complex methods and

movements in order to arrive timeously at a kill. The skills thus developed, together with the aggressive jousting for a share of the spoils, could well have paved the way for changes leading to a true hunting lifestyle.

By the same token, however, an adept scavenger does not necessarily have the need to become a hunter. A band of intimidating, stone-wielding primates, for instance, specialising in driving carnivores from their kills would have had no shortage of fresh meat. Indeed, if we were to envisage the entire troop migrating along the spoor of, say, a pride of lions, the lions could well find themselves in the service of such scavengers, having no choice but to forfeit a percentage of their regular kills in compliance with the appetites of the quasi-parasites.

Whatever the degree of success on the part of scavenging hominids, however, the home-base scenario, within the context of this interpretation, would have had less influence on our development than was originally thought. Scavengers are opportunists who follow the movements and thus also the migrations of other animals, and so the litter of these bygone times, once considered the middens of a domiciled society, now more accurately, it seemed, came to represent the temporary butchering sites of roving bands. Proto-man may thus have been neither hunter nor gatherer but at best a food-sharing scavenger who developed his wits, tools, and language amid the heated squabbles over captured prey.

There are those again who argue that man was at best a 'marginal scrounger' not particularly concerned with scavenging other than taking advantage of chance opportunities. The true driving force behind our development, this theory maintains, lay in the ability to communicate our thoughts. *Thus* was intelligence fostered, thus did the brain expand, and thus could we collectively think, plan, and survive. It is, after all, our *mental* competence that has enabled us to deal with the

range of situations, conditions, and environments that no living creature has been able to equal. We have, in effect, specialised in overcoming specialisation. We have dissolved the physical parameters determining the action of species, and for this we have our minds to thank.

And so, at the end of the day, we are left to grapple with the idea that developing man may have been nothing more than a talking ape, with the hunting episode possibly entering the fray sometime before the advent of agriculture and domestication of animals—quite the antithesis of the original idea. Like a pendulum swinging “from one extreme inexorably toward the other,” as Richard Leakey once put it,⁴ we have thus been transformed from bloodthirsty killers to articulate primates, with home bases, food sharing, and social efficacy having been abandoned along the way. Leaving us, who after all should know something about the human psyche, in somewhat unfamiliar territory. We who have blood dripping from the book of our history, who appear in the opening pages in tightly knit communities, armed, savage, and clothed in the skins of our prey, who have conquered the world and now challenge the forces of nature itself— we, supposedly, were handed our talents on a plate. We, so we are led to believe, bypassed the sense of urgency that spurs evolution on and decided to dominate, simply because we could.

It doesn't gel. The pendulum has swung too far, to use Leakey's analogy. What we have is ours by right of conquest. What we are is a product of the *will* to survive, and that will, in turn, is honed in relation to the struggle *necessary* to survive. Somehow, we have become alienated from this basic premise. We humans have battled our way to the top, pitted against odds to match our triumph. There is simply no other compromise envisaged in the life-or-death struggle of the selection process. If we emerged walking about on two

legs, armed, close-knit, and articulate, then these were the prerequisites for human survival. These were the attributes that *together* made possible our existence, whatever the order of priorities. And if this is seen as a romantic view of a bygone era, then it must be weighed up against the moderate romanticism of the present era.

Indeed, the moderate view is increasingly being forced onto a back footing. Based as it is on the interpretation of available evidence, new discoveries have forced a re-evaluation of its non-violent bias. The microscopic analysis of certain bones that were considered the remains of hominid meals, for instance, have since revealed striations, or cut marks, which clearly indicate the use of sharp-edged stone flakes for butchering. Obviously, our distant ancestors preferred their bones with the meat still on it, with some bones—given the tell-tale signs of tendons that were severed—suggesting the deliberate butchering of a carcass. This is certainly not the kind of activity one would expect from a ‘marginal scrounger’.

By implication, this brings us back to the earlier considerations of our swinging pendulum. Is our legacy, at the end of the day, that of a hunter or a scavenger? The bones would hint at both, although this can’t be satisfactorily verified. Some bones have incisions that were made *after* the gnawing teeth of carnivores left their mark, while others were cut *before* the carnivores got hold of them. As Pat Shipman, one of the researchers who discovered these marks, says, “When you see a cut mark on top of a gnaw mark, you can be sure you’re looking at a hominid scavenging. Unfortunately, when you see a gnaw mark over a cut mark, it’s equivocal. The hominid may have killed the animal. But then, the animal may have been dead when the hominid came along and butchered bits of it. Then a carnivore came along and had a gnaw at it. You just can’t know for sure.”⁵

What we do know for certain, of course, is that the use of pebble tools reaches back many, many years, and if we are to conclude that they were used primarily as butchering implements, then we humans have been meat eaters for *at least* 2.5 million years. This alone would go a long way in explaining why we're so different from the apes. If, furthermore, it were possible to determine whether some of these tools may have been used as weapons, then the pieces of the human puzzle would start to take on a very recognisable form indeed.

Modern research is pointing precisely in this direction. Not, as one would expect, in the form of epoch-old spearpoints and arrowheads but through the analysis of certain aspects of hominid physiology. Bipedalism, for instance, unquestionably sets us apart; this goes without saying. But then so does the less conspicuous human hand. Even *more* so, if you come to think of it, for if we were to eliminate everything from our day-to-day lives that is fashioned by our human hands—including sharp-edged stone flakes—we would literally be reduced to nothing more than intelligent, talking apes. Indeed, taking into account the interdependence of hand and brain function, it is in fact doubtful whether we'd be significantly intelligent at all.

We are, in the final analysis, tool users, and to this day, the sophistication of these tools determines the level of our success, be it economically or militarily. And it's not just a matter of intelligence (although this is an obvious determinant); our creative potential—our very humanness, as it were—is subject to the *functional ability* of the hand.

It wouldn't suffice, for instance, to graft a chimpanzee hand onto the wrist of a cerebrally-endowed human being. Even the most basic of human advances—like the shaping and use of a pebble tool—would, at best, be clumsily performed. The chimpanzee hand simply lacks the flexibility and co-ordination that we take for

granted, and basic functions like touching the tip of each finger with the tip of the thumb, or the base of the thumb with the tip of the little finger, are beyond the chimpanzee's capabilities. Our hands, which we generally assume to be standard primate issue, are in fact precision instruments that have, over the years, demanded significant changes to tendons, muscles, and nerves—even the tiny bones of the metacarpus—to make movements like this possible.

Function, at the end of the day, is determined by structure, but it is behaviour that ultimately determines that structure. We humans are structured to walk upright because of our terrestrial behaviour. The penguin, a bird that can hardly flap its 'wings', is uniquely structured to deal with its aquatic behaviour. The squid, which was once a shelled organism confined to the ocean floor and self-evidently learned to increase its manoeuvrability, is today structured to compete in open waters. This leaves us with the pertinent question: What kind of behaviour determined the structure of the human hand? Is it possible to deduce, by virtue of the interaction between behaviour and structure, what evolving Man might have been up to?

Technically speaking, the hand is merely a component of dexterity. It's actually the muscles of the forearm that do most of the work, manipulating the tendons of the hand like a puppeteer does his strings. The upper arm, in turn, supports the forearm, the shoulders, the upper arm, etc., with the brain capably behind the controls. As author Frank Wilson defines it, the hand is, in effect, "a specialised termination of a crane-like structure suspended from the neck and the upper chest."⁶

This would apply to the apes as well, of course, but we humans have one added feature: hip rotation. A bipedal tool user would inevitably develop greater flexibility of the torso, one would surmise, thereby further extending the range of this 'cranelike structure'.

But the biomechanical evidence emphasises not so much freer movement as it does the capacity to perform fast, whiplash actions designed to significantly increase the *momentum* of the arms. Whatever it was that developing man held in his hands, in other words, he wanted it to move with as much speed and power as he could muster.

Immediately the use of projectiles comes to mind, which we all know involves a certain flexing at the knees and twisting of the pelvis. But the same applies when preparing to strike hard with the hand—or with something held in the hand, for that matter—and it is here that the incriminating evidence, as it were, comes to the fore, for if you intend striking hard with an object held in the hands, you need to be able to keep a firm grip on it. And the human hand, in contrast to those of other anthropoids, is designed to do just that.

The opposable human thumb, for one (being able to flex across to the base of the little finger), ensures that objects remain firmly seated in the palm, hence its length and the thick muscles at its base. The little finger, likewise supported by strong muscles at the opposite side of the palm, performs a similar retaining function closer to the wrist, flexing downwards where the thumb flexes up. Together with the remaining fingers, the result is an effective clamping action—a biological chuck, if you will.

Just take a moment to tightly curl the fingers of one hand, imagining a sizeable stone is being grasped. It's quite a work of art when you come to think of it, the way the fingers co-operate to retain a hold onto something. And, as we all know, this chuck-like grip enables us to deal with all sorts of irregular objects, with the thumb and little finger playing a pivotal role given the potential for muscle support at their bases. Interestingly, they also serve distinct purposes. When throwing the likes of a ball or a stone, for instance, the little finger is largely inactive, with the thumb taking up

most of the work, supported by the index and middle fingers. The same applies when pounding—cracking nuts or bones or constructing pebble tools. The little finger, on the other hand, comes into its own when force is exerted *beyond* the limits of the hand. When, in effect, an object like a stick or something similar serves as an extension to the arm.

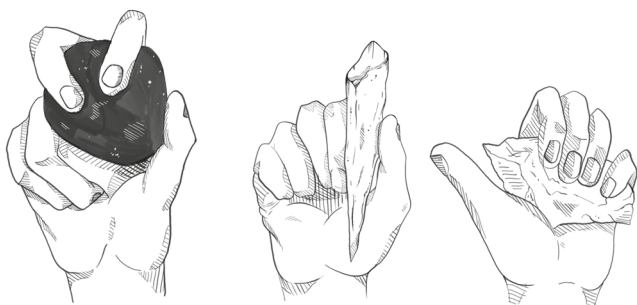
Chimpanzees that have been observed using the likes of sticks for clubbing do so rather awkwardly, typically with their palms facing upward. This is not due to a lack of intelligence or experience on their part, but a practical necessity given the lack of strength in their little fingers to absorb or resist the recoil effect of a blow should they strike with the palm facing down. If one were to make a forceful blow with a hammer, for instance, without the support of the little finger, the handle would be inclined to slip from the hand. This is precisely the problem chimpanzees are faced with, and so to compensate, they utilise the palm instead to absorb the recoil effect—gripping the hammer handle from underneath, as it were—to perform the same function. It goes without saying that there is little strength in their blows, and they do so by and large to display aggression.

The same instrument in the hands of a human, on the other hand, becomes a lethal weapon. Indeed, we've gone well beyond the brandishing of sticks and clubs (beyond the brandishing of swords and maces, for that matter) and now adroitly swing golf clubs and tennis rackets, oblivious to the fact that this must have taken millions of years to accomplish. Literally tens of thousands of generations must have been at work transforming the bungling, branch-grasping appendage of our bygone forebears into the tool-manipulating hand that we possess today. And whatever it was that edged them on, it would seem, certainly did not stop at digging roots or cracking open bones.

Mary Marzke, past professor in physical anthropology at Arizona State University, conducted some interesting experiments in this regard. Looking at the functions of the human hand from a Stone Age perspective, volunteers were studied as they manufactured simple stone tools and then used them to “shell walnuts, hazelnuts, and mongongo nuts, cut vegetation, dig for roots and cut skin, muscle, sinews and bones of a chicken.” Correspondences between the structure of the hand and the various finger and palm grips thus utilised were identified and then compared with the functional ability of, among others, the hand of a 3.2-million-year-old *afarensis* specimen, nicknamed ‘Lucy’ by its discoverers. The conclusion was that, although in many respects still anthropoid, the hands of this hominid were at least partially ‘modern’. Modification of joint surfaces and wrist bone orientation at the base of the thumb, index, and middle fingers indicated that Lucy, although unable to effectively employ the ‘clubbing’ grasp which involves the little finger, was, however, quite adept at firmly retaining irregular objects such as stones. As Marzke comments, “The grips most likely to have exploited the pattern of human features found in the Hadar [Lucy’s] hand are the three-jaw chuck thumb/finger, buttressed pad-to-side, and digitopalmar grips, which proved to be preferred grips in activities involving the use of unmodified stones, including pounding, cutting, slicing, chopping and digging.”⁷

Lucy, in other words, would have been quite a capable tool user almost a million years *before* the acknowledged advent of stone tools. Indeed, the range of actions facilitated by the powerful ‘three-jaw-chuck’ grip may well have extended beyond our limited understanding of a hand that was not quite our own. To what degree, for instance, could the wielding of *weapons* have been successfully employed? What would Marzke’s results have revealed, for example, if

sticks were used for stabbing and jabbing? Surely this would have been within the scope of Lucy's abilities?



Three-jaw chuck
thumb-to-finger

Buttressed pad-to-
side

Digitopalmar

How effectively indeed, despite lacking the telltale signs of little finger flexion, could the *afarensis* hand have employed tools for clubbing?

What Marzke does confirm is that the ‘three-jaw-chuck’ grip also facilitates the “controlled manipulation of stone missiles” and that the “possibility of not only intimidating but also stunning or killing potential prey at a distance could have been enhanced in *A. afarensis*.”⁸ And not only could Lucy have thrown stones accurately, it seems, but she could have done so with considerable force for, surprisingly, she was also able to make use of the hip rotating process to accelerate her momentum. Lucy, to use Frank Wilson’s analogy, “might have been at home on a pitcher’s mound.”⁹

This is extraordinary, to say the least, and could go a long way in explaining the loss of our fighting canines at the very dawn of our kind. I do, however, have my reservations when it comes to the predatory potential of stone throwing. Frankly, judging by my own desperate attempts on an empty stomach, you need to be an

exceptionally talented thrower to bring down a roosting bird with a stone, let alone an elusive, fleet-footed mammal. A long stick, on the other hand, may award one with the occasional lizard or snake—a rodent even—utilising the same whiplash momentum to make the kill. My point being that the *striking* action, rather than the *throwing* action, would have had greater influence on the development of the hip-rotating trait. Stone throwing is, in essence, an intimidating and defensive strategy and as such places limited demand on precision. There is less technique involved in scaring animals off, in other words, than there is in killing them ... and the pattern of our physical development has been one of increasing expertise.

This increasing expertise, of course, can be attributed to our reliance on tools and their use in pounding, digging, scraping, etc. What is of particular interest in this regard, however, is that the hip-rotating trait is performed primarily from the *standing* position and, as such, would have little to do with these functions. The twisting, wind-up action, in other words, designed primarily to extend a degree of *force* to the arms must have developed with other objectives in mind.

And so, our pendulum comes hurtling back as we recall Darwin postulating that the ‘progenitors of man’ would have been better able to ‘attack their prey’ from the standing position. More specifically, the words of the intuitive Raymond Dart ring true: “This purposive industrial specialisation of the hands in accurate hitting and throwing,” he argued almost a century ago, “was the only persistent stimulus capable of transferring the body weight from the clambering knuckles.”¹⁰

Outdated views, perhaps, of an outdated generation, but entirely relevant to the modern debate, it would seem.

Ironically, the impetus to look for an alternative to the hunting hypothesis was largely provided by none

other than Raymond Dart himself—unwittingly, that is. Dart's ideas were of such a nature that they simply could not be left unchallenged. Perhaps not so much because he was a maverick—one of the 'wild men' of anthropology at the time who didn't quite toe the academic line (as his protégé Philip Tobias eloquently put it, he had a "willingness to free his mind from the shackles of authority"¹¹)—but because, while the scientific community at the time was still ruminating over his claim that the gracile, ape-brained creature he had discovered represented the human ancestor, he went on to propose that a 'Bone Age' had preceded the Stone Age and that his 'South African Ape' had been an active participant in this epoch. *Australopithecus* wielded weapons of bones, toothed jaws, and horns, Dart claimed, and used them not only to actively hunt baboons and feast on their brains but to cannibalise his own kind as well.

Now, if a gracile, small-brained ape was a concept that took time to digest, then one can just imagine the enormity of the idea that Dart now expected his colleagues to swallow. To this day, in fact, these ideas of his are looked upon with distrust. And to say the least, the response of the hundred-odd anthropologists gathered at the 1955 Pan African Congress in prehistory, where Dart presented this thesis, was anything but enthusiastic. Only two or three questions were raised after his allotted twenty minutes, after which the Chairman, Louis Leakey (who only two years before had dismissed the idea that *Australopithecus* could be ancestral to man in a book entitled *Adams Ancestors*), concluded, commenting that "one must be very cautious of conclusions drawn from cave deposits."¹²

Six years of research by Dart and his colleagues, including two years of preparation for the congress, thus elicited a call for caution. Despite five days of deliberation on human prehistory at the time, the subject was afforded no further discussion, and one

could probably not have expected otherwise. As Robert Ardrey, a stalwart supporter of Dart's and a contemporary author opined, "an entire body of scientific opinion [was] confronted by evidence disturbing the premises of its field and challenging all fashionable conclusions concerning the nature of man."¹³ The ramifications were that, along with the bloodthirsty, cannibalistic ape that Dart envisaged, the more tenable idea of an antilithic (before stone) era of tool usage became, and remains, unorthodox.

But perhaps by now things may have changed. Perhaps today we can entertain the thought that chimpanzees, given the opportunity, would also 'feast' on adult baboons and not just juvenile and infant monkeys, and the fact that they don't doesn't preclude the idea that a similar distant ape species may have stumbled upon the means, having disregarded the limitations of the canines and instead enlisted the aid of an extracorporeal component—a stone smashed against the head rather than a moot attempt at rupturing a jugular. From the perspective of *predatory delinquency*, this is precisely the kind of advantage that would see the chimpanzees elevated to greater levels of predation, and my suspicion is that this is precisely where our human story begins.

Dart, I suspect, would have required little persuasion in this regard. The stockpile of fossil bones he had collected from a number of South African cave deposits certainly left him with no doubt that the occupants had had a predilection for primate flesh. The occupants themselves he also considered to be primates—australopithecines, in fact, that had learned to kill with just such 'extracorporeal components'. Uncannily perhaps, these ideas of his were spawned right at the genesis of the modern human debate, along with the discovery of the first 'missing link'.

The very first fossilised skull of a South African primate that Dart, the newly appointed professor of

anatomy at the University of the Witwatersrand, held in his hands was that of a baboon retrieved from the lime works at Taung, situated in the arid interior of the country. "A baffling feature," he recalls in *Adventures with the Missing Link*, "was a hole in the front part of the roof of the skull, as if it had been struck by a sharp instrument,"¹⁴ adding that he only noted this briefly. It was a rare find at the time, and a delivery of bone-bearing breccia from the same site was consequently arranged, with two caseloads of it arriving in Johannesburg only days later. The subsequent discovery of the 'Taung Child'—the first australopithecine—is best told in Dart's own words:

As soon as I had removed the lid a thrill of excitement shot through me. On the very top of the rock heap was what was undoubtedly an endocranial cast or a mould of the interior of a skull. Had it been only the fossilised brain cast of any ape it would have ranked as a great discovery, for such a thing had never before been reported.

But I knew at a glance that what lay in my hands was no ordinary anthropoidal brain. Here in lime-consolidated sand was the replica of a brain three times as large as that of a baboon and considerably bigger than that of any adult chimpanzee. The startling image of the convolutions and furrows of the brain and the blood vessels of the skull was plainly visible. It was not big enough for primitive man, but even for an ape it was a big bulging brain and, most important, the forebrain was so big and had grown so far backwards that it completely covered the hindbrain.

Was there, anywhere among this pile of rocks, a face to fit the brain? I ransacked feverishly through the boxes. My search was rewarded, for I found a large stone with a depression into which the cast fitted perfectly. There was faintly

visible in the stone the outline of a broken part of the skull and even the back of the lower jaw and a tooth socket which showed that the face might still be somewhere in the block.

I must emphasise here the particular reason for my excitement. The most impressive feature of this endocast, or brain cast, as they are sometimes loosely called, was the marked distance separating the two well-defined and unmistakable furrows at the back of its outer surface.

These two furrows, called the lunate (or moon-shaped) and parallel sulci, are found in the brains of apes and often of men – especially primitive men. My old professor in University College, London, Grafton Elliot Smith, had been the first to find the lunate sulcus in human brains and thus make these landmarks famous.

In some human brains, however, the brain substance in the territory between these two furrows expands so much that the lunate sulcus becomes greatly separated from the parallel sulcus and, especially in very advanced brains, is pushed back so far that it entirely disappears from the outer aspect of the brain.

In the Taung's cast, so much of this expansion had occurred between the lunate and parallel sulci that they were separated by a distance three times as great as in any existing endocast of a living ape's skull, whether chimpanzee or gorilla. So even had I found no trace of the face in the rock, or if it had proved to be defective, I would still have known instantly that this creature whose skull could give a cast of this sort must have been at least three times as intelligent as any living ape.

I stood in the shade holding the brain as greedily as any miser hugs his gold, my mind racing ahead. Here, I was certain, was one of the most significant finds ever made in the history of anthropology.¹⁵

Dart ‘pondered the mystery’ of how a large-brained ape could have survived under the semi-arid conditions that had prevailed in the region for millions of years. “What could an anthropoid ape with a brain bigger than that of a chimpanzee and rivalling that of a gorilla be doing down here in South Africa,” he recalls thinking, “away from the tropical forests and jungles, out in the open grass-covered plains and undulating, treeless prairie lands of the Transvaal?” And then his mind ‘flashed back’ to the baboon skull that had come from the same site: “I remembered the neat round hole on the top of the right side. Was it possible that the opening had been made by another creature to extract its brain for food? Did this ape with the big brain catch and eat baboons?”¹⁶

A few weeks later, while on academic business at the South African Museum in Cape Town, he discovered that a number of baboon skulls from the same site at Taung had found their way there. Needless to say, these were “generously placed at [his] disposal for examination”¹⁷ and subsequently showed the same signs of having been damaged before fossilisation. There were two possible explanations according to Dart. Either the baboons were the victims of a series of rock-falls, or the big-brained ape that he had discovered had been carnivorous and deliberately killed the baboons.

It would be two decades before Dart would raise the ‘killer ape’ scenario, however, having since admitted that this view was ‘too revolutionary even to whisper it to anyone else’. War had intervened, and in the years prior to the outbreak of hostilities, he had devoted his time to other priorities, in particular comparative neurology, his ‘first love’. Robert Broom, meanwhile, curator of the Transvaal Museum and wholehearted supporter of Dart’s, had discovered the remains of the first adult *africanus* to the north of Johannesburg in 1936, and in 1938 the remains of the first *robustus* specimen at a site nearby.

Towards the close of war, with his responsibilities at the medical school coming to an end, Dart immersed himself into the subject once again. A location some 250 kilometres to the north known as Makapansgat had shown promising signs of further discoveries, and after some needling by Phillip Tobias, one of his students at the time, an excursion to the site was arranged for the entire anatomy class. It proved to be a treasure trove of fossil-bearing breccia that yielded the remains of pigs, antelope, giraffe, hyenas, jackal—even elephants—as well as a number of extinct animals such as the horse *Hiparrion* and the bear-like *Chalicothere*. As fate would have it, several skulls of *Parapapio broomi*, the extinct baboon that had led to the initial discovery of *Australopithecus*, were also unearthed, and like the skulls discovered at Taung, these also bore the tell-tale signs of having been damaged prior to fossilisation.

Overseas interest in the South African fossils was increasing, and in December of 1946, the world-renowned paleoanthropologist and professor of anatomy at the University of Oxford, Wilfrid Le Gros Clark, arrived in South Africa for a firsthand evaluation of the finds there. An important guest, he was graciously received by both Broom and Dart, who accompanied him to the various discovery sites, also placing at his disposal the different fossils they had discovered for examination. Inevitably, he was introduced to the anomaly of the damaged baboon skulls and, after having examined a number of these specimens himself, suggested that a ‘statistical inquiry’ might provide some clarity.

Dart subsequently gathered together what cranial remains he could lay his hands on and came up with some intriguing results. Of the forty-two baboon individuals collected from three different deposits, twenty-seven, or roughly sixty-four percent, were fractured at the front of the head. A further seventeen percent had fractures on the left side of the face,

fourteen percent at the rear, while the remaining two individuals, represented only by jaw fragments, were not determinable.¹⁸ If the blows had been made by a club of some sort, as Dart suspected, and weren't the result of natural causes, then from this perspective, thirty-four individuals (representing eighty-one percent of the specimens) must have been facing their attackers at the time. Furthermore, 'all but two skulls' would have received a blow from a right-handed assailant.

Dart had not yet completed his investigation when he was handed the newly discovered mandible of an adolescent male australopithecine recovered from the Makapansgat lime works, the "best example of localised fractures [he] had yet seen." The jaw had been split on both sides by a blow that had knocked out the four front incisors and showed no signs of having healed. "This lad had obviously met a violent death," Dart concluded. "This was the work of either a fist or a bludgeon."¹⁹

This "dramatic specimen," he later wrote, instantly prompted him to further investigate the "murderous and apparently cannibalistic" lifestyle of *Australopithecus*.²⁰ It was now 1948, twenty-three years after the discovery of the 'missing link', and the idea that *Australopithecus* moved about on two legs was slowly receiving the nod from academics worldwide. Robert Broom had discovered the pelvic bone of an australopithecine only the year before, which was so akin to the human pelvis that there could no longer be any serious doubters. *Australopithecus* was human from the neck down, it now became apparent, which brought to the fore the *cultural* aspects of its existence—to what extent would its *habits* have been similar to ours? Dart's contention, of course, was that the australopithecines had hunted like us—with weapons. The only problem was that there were no weapons to be found among the growing stockpile of fossilised debris, despite an increasing number of skulls being unearthed that had the same

radiating fractures indicative of a localised blow to the head.

To this end, Dart approached a colleague, Dr R. H. Mackintosh, professor of Forensic Medicine and specialist in “cranial injuries inflicted by lethal implements”²¹ for an opinion. Upon examining the baboon skull that had ended up in Dart’s possession two decades earlier, Mackintosh declared, “I have had people hanged on evidence similar to that.”²² The outer table of the skull had been forced open from within—the type of damage one would expect from an object exiting the skull. Wryly commenting that bullets in this case could be excluded, Mackintosh concluded that a stick or a bone could have been used to similar effect.

Whether Dart embraced his colleague at this point we will never know, but his excitement at this news certainly would have warranted it. The weapon that had been eluding him all along lay discarded among the remains of its victims! *Australopithecus* needed neither the skill nor the intellect to fashion a truncheon; nature had provided him one in the form of a long bone with a distal end that could split open the skull of even the hardiest of creatures. To wit, the broken shaft would make a formidable stabbing implement in the hands of a bipedal hunter.

Dart recounts these moments in *Adventures with the Missing Link*:

I immediately started investigations to corroborate the fascinating theory that had sprung from Mackintosh’s words and searched through my carefully hoarded collection of fossil bones. I picked out all those whose ends had double ridges which might fit into the Y-shaped depression of the skulls. I did not have far to look because the most frequent type of long bone found in the bone breccia was the humerus (upper arm bone) of the antelope. The elbow

end of these bones in all antelopes has two ridges.

Not only did the ridges of many of the humeri fit perfectly into the depressed fractures, but most of the upper arm bone ridges of the antelopes had been broken before fossilisation. Makapansgat had yielded the best display of these humeri with broken ridges, but the fossil baboons from both Taungs (sic) and Sterkfontein showed the same type of double-valleculated, bone-bludgeon fracture. As all three sites are about 200 miles from one another in various directions it was clear that bludgeoning was characteristic of all South African man-apes.²³

Dart subsequently immersed himself into what he referred to as “one of the most fantastic and rewarding studies” of his life.²⁴ He had stumbled upon a discovery perhaps as momentous as the missing link that he had announced to the world all those years ago. *Australopithecus* had been a *tool user*. But it didn’t end there—the tools he used predated the Stone Age, and as such the South African man-apes embodied not only the physical foundations of man but also the cultural ... a culture that happened to be entirely new to science.

This was not well received.

Dart had just found himself in a position where leading scientists were retracting their opposition to his claims that *Australopithecus* was ancestral to man. Sir Arthur Keith, an erstwhile counsellor of his at University College, London, who had once declared his conclusions “preposterous,”²⁵ stated frankly in a note to *Nature* that “Prof. Dart was right and I was wrong.”²⁶ Le Gros Clark released a paper in the *Journal of Anatomy* that same year (1947) acknowledging that *Australopithecus*’ “zoological relationship to the *Hominidae* can hardly be doubted.”²⁷

Against this background, Dart now published a preliminary paper in the journal *South African Science* called “The bone bludgeon hunting technique of *Australopithecus*” wherein he emphasised that “the matters of major importance now are not “did *Australopithecus* wield weapons?” but “what weapons did *Australopithecus* wield?”²⁸ A month later, in an article that appeared in the *American Journal of Anthropology*, he concluded his findings on the damaged baboon crania under the title “The predatory implemental technique of *Australopithecus*.”²⁹ Outlining the ‘specific nature’ of the damage, he argued that the V-shaped depressions evident among several of the skulls were caused by a blow from an ungulate humerus. Twisted muzzles and shattered jaws suggested the same. Punctured depressions again suggested the ‘employment of pointed objects’ such as horn tips and broken bone shafts. Some of the specimens, he added, indicated that the cerebral contents may have been forcibly removed.

Once again, he found himself mired in controversy. The first criticism came from the award-winning palaeontologist D. M. S. Watson who was in South Africa at the time and had the opportunity to inspect the baboon skulls. His conclusion was emphatic—the fractures were the work of hyenas that had once occupied the caves.³⁰ Another prominent palaeontologist, Kenneth Oakley, following a tour of the South African sites in the early fifties, agreed that carnivores had probably occupied the caves and, in his opinion, the presence of the *Australopithecines* suggested that *they* in fact had been the prey.³¹

Dart doggedly continued his research despite growing opposition to his latest claims, and the fact that he had a propensity for the dramatic when putting his thoughts into writing certainly didn’t work in his favour: “Either these Procrustean proto-human folk tore the battered bodies of their quarries apart limb from limb and slaked their thirst with blood, consuming the

flesh raw like every other carnivorous beast,” he argued in the *International Anthropological and Linguistic Review*, “or, like early man, some of them understood the advantages of fire as well as the use of missiles and clubs.”³²

His claim that the man-apes had made use of fire was based on the discovery of blackened bones at Makapansgat and traces of carbon in the breccia. This added to the controversy, and the frustration among academia was becoming palpable. Oakley, for instance, argued that grass fires could have ignited the bat guano in the cave and bemoaned the fact that “one bit of microscopic smut” had led Dart to initially name the species found there *prometheus*, after the Greek god of fire.³³ Le Gros Clark had his own axe to grind. Besides *prometheus*, names such as *crassidens*, *transvaalensis*, and *capensis* were also being bandied about in an ‘uncontrolled multiplication’ of genera and species. “The whole history of these S.A. discoveries has been bedevilled by the unbalanced claims made by local workers,” he complained in a letter to Oakley.³⁴

By the time Dart had consolidated his research and published a 105-page monograph on the subject called “The Osteodontokeratic Culture of Prometheus,” the lines had already been drawn. Those overseas, by and large, wanted little to do with his outlandish theories. This did not merely revolve around the issue that his interpretations seemed to “outrun his evidence,” as the zoologist Charles Reed succinctly put it.³⁵ At the heart of the matter was the cultural status of the South African man-apes. As Dart was at pains to emphasise, he considered the Australopithecines to have been culturally hominised. They were, in effect, primitive humans by virtue of their living conditions which, if his assessment was correct, would have resembled that of our own not-too-distant cave-dwelling forebears. What set them apart was that they had not yet learnt the art of stone knapping. Instead, they fashioned their tools from

bones, teeth, and horns, as the term *osteodontokeratic* implies.

Clearly, the concept was revolutionary. The orthodox view that stone implements represented the genesis of tool usage was deeply entrenched and in fact holds sway to this day. Indeed, the humanness of our forebears is *determined* by the presence of stone tools—*homo* and the lithic culture have become inseparable. Ascribing cultural attributes to a small-brained primate that had not revealed even an inkling of stone tool usage was an invitation to ridicule.

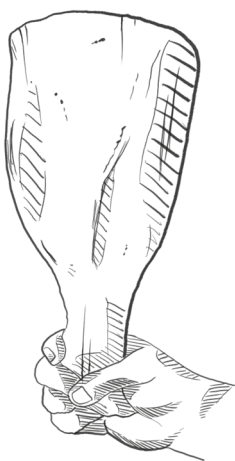
“Those who have not hesitated to express contrary views,” Dart later argued, “lacked the first-hand knowledge of the relevant material which is vital for its understanding.”³⁶ In his view, the predominance of certain bones in the cave breccias suggested that they had been selected for their usefulness as tools. Wearing and, in some cases, modifications of the bones confirmed this. Hyena half-mandibles with the canine attached, for instance, would have been useful for the dismembering of a carcass. Gazelle horns were ideal for digging, and shoulder blades with their narrow edges could have served as choppers. Antelope jaws, again, made good scrapers, and long bones, of course, were the perfect tool for clubbing.



Ripping



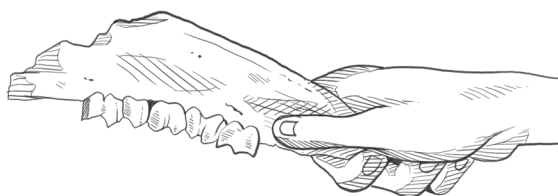
Digging



Chopping



Clubbing



Scraping

“The uses to which these several types of ostodontokeratic tools have been applied did not spring unassisted from the writer’s imagination!” Dart emphasised in his monograph. “Such understanding as we have of their purpose has emerged step by step during the past thirty years through the process of striving to explain the facts, both specific and statistical, presented not by cogitation but by the broken

skulls and bones found in these australopithecine breccias.”³⁷

Le Gros Clark, who was approached by the journal *Nature* to review Dart’s monograph, summed up the prevailing sentiment at the time in an article titled “Hominids and Humans,” which appeared a few months after Dart’s publication:

... while the australopithecines may be accepted as early representatives of the family Hominidae, it does not necessarily follow that such terms as ‘human’ or ‘man’ can properly be applied to them. It is important to emphasize this distinction, for much confusion has unhappily been introduced into discussions on hominid evolution by the careless use of these colloquial terms. If it is agreed that the term ‘man’ should be reserved for those more advanced stages of hominid evolution characterised by the ability to fabricate tools, it is clearly not applicable to such primitive hominids as the australopithecines unless it can be demonstrated that they were tool makers.

The evidence which has so far been adduced for such a conclusion has either proved to be faulty, or, at the most, no more than suggestive. Prof. Dart, in his monograph on the bone breccias from the australopithecine deposits at Makapan, insists that it is much more than suggestive, for he claims that the rich assortment of animal remains from this breccia bears witness to an elaborate bone culture. But it is one thing to show, as Dart endeavours to do, that these fragments of bones and jaws could have been used as tools and weapons, and quite another thing to prove that they were used as such. Without doubt, Dart goes far beyond the legitimate limits of his evidence in propounding these claims, and it is a pity that this should be so ...³⁸

Dart announced his retirement the following year (1958), but this did not stop him from publishing more than a dozen articles on the subject over the next decade or so. And it was these latter years that defined what ‘going far beyond the legitimate limits of his evidence’ meant. Titles such as “Osteodontokeratic ripping tools and pulp scoops for teething and edentulous australopithecines,”³⁹ “Australopithecine cordage and thongs,”⁴⁰ and “Tree chopping with an elephant rib”⁴¹ now saw the light of day. Feeding spoons and shovel utensils were identified, as well as skulls that served as platters and bowls—buffalo skulls with the horns attached having the added advantage of steadying the bowl “in which to mash or triturate any tough type of food.”⁴² Furthermore, stalactites were proposed as an additional tool material, representing a possible missing ‘cultural link’ between skeletal and stone tool making.⁴³

As previously mentioned, Dart was one of the ‘wild men’ of the early days of anthropology and not averse to expressing wild ideas. And, if nothing else, his penchant for controversy invited debate (which may well have been his intent). The upshot of it was, to quote Tobias, that it “forced palaeontologists and zealous research students to examine what alternative explanations might be offered.”⁴⁴ Inevitably, this was to lead to a methodical examination of the limestone deposits, and as a result a new science was born: taphonomy—the study of the process of fossilisation. It would prove to be the undoing of Dart’s work.

The person central to these developments was the geologist C. K. Brain who, from his school-going days in Pretoria, had an affiliation with the Transvaal Museum where he had learnt to mount birds. After graduating, he ended up working at the Centre for Scientific and Industrial Research, also in Pretoria, and was approached by J. T. Robinson, who had replaced

Robert Broom as curator, to analyse some of the sediments at a man-ape site called Swartkrans. As a result of his contribution, Brain was later offered a permanent position at the museum, and in 1958 he published a monograph on the subject called "The Transvaal Ape-Man-Bearing Deposits" wherein he detailed how the various sites had formed and which agencies were involved in the deposits.⁴⁵ His work soon brought him international acclaim.

Brain was a scientist's scientist, as Robert Ardrey describes him in *African Genesis*, with a "long, distinguished face" and disposed to "long, distinguished silences."⁴⁶ He had majored in geology and zoology, and at the museum he now became involved in palaeontology and anthropology, a combination of expertise that left him well-equipped to investigate Dart's claims. He was later to admit that Dart's conclusions had in fact provoked him into undertaking "further taphonomic investigations."⁴⁷

In 1965, he took up the post of Curator of Palaeontology and three years later was appointed Director of the museum, a position he retained until his retirement. For more than a decade, he subsequently carried out his 'taphonomic investigations', painstakingly combing through tonnes of discarded breccia and conducting excavations at three well-known man-ape sites to establish what animals, and which of their body parts, had ended up there. His research included the exposure of bones to the Namib sun to determine the effects of weathering, monitoring the skeletal remains of animals fed to captive carnivores, and analysing the discarded goat bones of modern-day desert communities. Hyena lairs and porcupine dens were scrutinised as well as the bones left behind by owls and eagles. In addition to the australopithecine sites, a bushman shelter and a number of Stone Age settlements were also thoroughly excavated for a comparative analysis.

The results of his studies were published in an extensive reference work in 1981 called *The Hunters or the Hunted? An introduction to African Cave Taphonomy*. Literally tens of thousands of bones had been meticulously measured, inspected, and catalogued, each according to skeletal part, place of origin, and the species that it represented, providing a wealth of statistical information with which to approach the osteodontokeratic hypothesis. The long and short of it was that Brain was unable to substantiate Dart's claims.

The man-ape deposits typified the accumulations produced by carnivores, and not those of a member of the human family, he had found. Primitive human settlements almost exclusively contained the remains of herbivores, whereas carnivore lairs typically include a substantial share of carnivore remains due to the fact that carnivores will prey on almost anything that presents itself as a meal—including other carnivores. Primitive human activity also produced large amounts of bone flakes (the result of cracking open bones to get to the marrow), whereas carnivores—particularly hyenas—tend to consume the flakes they produce when crunching bones. To draw a comparison, the australopithecine-containing breccias produced substantial amounts of carnivore remains and low numbers of bone flakes.

Dart had claimed that the predominance of the distal, or 'elbow', ends of antelope humeri were the result of their choice as bludgeons and that bones with worn ends indicated that they had been used for digging and scraping. Brain, on the other hand, was able to establish that the distal ends are simply more resistant to destruction and that smooth, rounded edges were common among bones that had been extensively trampled underfoot. Dart moreover contended that the man-apes were head-hunters, based on the disproportionate number of baboon skulls in the deposits, and argued that hyenas could not have been responsible for

these accumulations as they do not bring the bones of their prey back to their dens. Brain, again, made the interesting discovery that the brown hyena—the shy and lesser-known cousin of the spotted hyena—does in fact bring the carcasses of its prey back to its lair. They happen to be accomplished hunters and prey on antelope and smaller carnivores such as jackal and lynx—even cheetahs—and, interestingly, also baboons. Indeed, according to Brain, “baboons are probably one of the characteristic prey species brought back to their lairs when cubs are raised.”⁴⁸ The most striking aspect of their eating habits, Brain found, is that the skulls are typically left intact:

The brown hyenas’ habit of bringing the bodies of carnivores (and baboons, on Kruger Park evidence) to their lairs and of often leaving the heads of these prey animals undamaged is of great significance to our understanding of bone accumulations in caves. Brown hyenas undoubtedly use dolomitic caves as breeding lairs and could be responsible for extensive bone accumulations made over many years.⁴⁹

In addition to brown hyenas, leopards were also identified as occupying caves as feeding lairs. One such site at Mount Suswa, Kenya, contained the remains of at least thirty-seven individual baboons,⁵⁰ and observations made by V. J. Wilson, a former curator of the National Museum at Bulawayo, indicated that leopards *also* tend to leave the heads of baboons and monkeys intact.⁵¹ To top it all, leopards are known to leave round punctuate marks in the skulls of their primate victims, presumably when dragging the body along by the head, and Brain had established that the two holes found in the back of the head of an australopithecine specimen unearthed years earlier matched exactly with the spacing of a leopard’s lower canines.⁵²

Dart's hypothesis was dealt a devastating blow with this information from which it would not recover. The debate was over as far as his critics were concerned, and to this day words such as 'false' and 'fantasy' are used by prominent individuals in the field when referring to his osteodontokeratic culture. Yet, it is to be doubted whether C. K. Brain himself would have used words such as these. He may have produced substantive evidence to challenge Dart's claims, but to assume that he considered the subject closed would be incorrect. There were several issues that remained unresolved.

Regarding the food remains of 'precultural hominids' for instance, he states the following:

The recognition of hominid food remains in the absence of both artefacts and traces of fire would be extremely difficult, and I would certainly not be competent to make such a diagnosis. It presumably would depend on the damage done to bones by hominid teeth – a subject requiring a good deal of further study.⁵³

There was simply no telling, in other words, whether the man-apes had contributed to the bone assemblages as predators or as prey, regardless of what the statistics suggested. To wit, one particular assemblage known as Kromdraai *B*, of which some fifty-seven point nine percent of the remains consisted of bone flakes, was "very reminiscent of that to be seen in Later Stone Age human food remains," according to Brain.⁵⁴ Despite this, given the absence of a cultural artefact such as a hammerstone, or perhaps a charred piece of bone, he considered the involvement of hominids "very dubious."

As far as the deliberate bludgeoning of baboon crania was concerned, Brain remained ambiguous, expressing his doubt whether Dart's theory could be satisfactorily

proved or disproved—despite his taking the position that the fractures could be attributed to other causes:

If it could be demonstrated beyond doubt that the injuries had been inflicted before the skulls were buried in the cave earth, then I would have no hesitation in agreeing that deliberate hominid activity was indicated. But it is extremely difficult to separate the effects of localized pressure within the enclosing matrix from prefossilization injury. Stones or other hard objects in the matrix can cause depressed fractures most suggestive of hominid violence. Regrettably, most skulls available at present showing this particular kind of damage have been freed from their matrix, and so the controversy concerning them cannot be resolved.⁵⁵

Interestingly, several baboon skulls recovered from the Taung lime works were predominantly filled with a sandy matrix, suggesting that they may well have been fossilised in a *stone-free* environment. Despite this, they share the same kind of fractures as their counterparts several hundred miles away. Again, due to their having been removed from the matrix they were found in, the exact cause of these injuries remains uncertain.⁵⁶

Brain's results were clearly not as cut and dry as the orthodoxy would have us believe—room for doubt remains on both sides. Admittedly, a number of Dart's ideas should preferably be left under the table, but does it then follow that the entirety of his argument should be renounced? Surely there must be some merit to the idea that proto-man made use of organic material for his implemental needs. Wood, hide, and reeds, after all, are most readily available as a resource—and, dare I say, so are bones. As Lyall Watson, who himself once sorted through the Makapansgat breccia under the

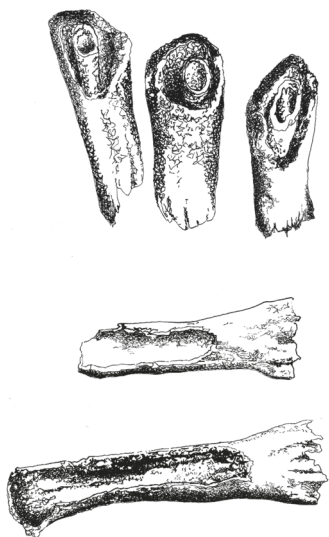
tutelage of Dart, has opined, “He [Dart] was undoubtedly right about a culture growing around bones, teeth and horns long before stone tools were ever worked – and his critics were wrong to deride him.”⁵⁷ Several of the ‘local workers’ in South Africa, in fact, who in Dart’s opinion were “more privileged by knowledge of the bones concerned,”⁵⁸ were actively pursuing the matter. Phillip Tobias, for one—professor, and head of anatomy at the time—argued in favour of “cultural objects of bone, horn and tooth” in an article that appeared in the *Proceedings of the Prehistoric Society* in 1967. Emphasising the cultural status of *Australopithecus*, which he based on correspondences with *homo*, and pointing out that even chimpanzees will modify a stick to “make a tool serviceable for solving problems,” he remarks:

Yet, Dart’s claims, stated with his accustomed vigour, have aroused much opposition, especially from those who have not studied the original specimens. Some of his fellow scientists, it would seem, have been more ready to accept that *Australopithecus* made stone tools, than that he modified and used a material readily at hand, namely the bones of the animals eaten – and this despite the fact that bone has formed an integral part of the cultural materials of man, in every culture from that of Choukoutien to the present.⁵⁹

He makes a valid point. If stone artefacts had been identified in the man-ape deposits at the time, then *Australopithecus* would undoubtedly have been associated with their usage. Yet, bewildering as it may seem, evidence suggesting that certain bones may have been modified by *Australopithecus* was set aside, and the cultural implications along with it.

Brain himself, in *The Hunter or the Hunted*, admitted that there was some substance to Dart's bone tool claims:

Although I cannot agree that the vast majority of bones from the grey breccia show signs of hominid modification, Dart and Kitching [J. W.] have shown me some specimens bearing signs that could be interpreted as such. Examples are bovid metapodials that have been indented on one surface only. Had such damage been caused by the teeth of a carnivore, one would expect to see comparable damage on the opposing surface as well. A secondary category consists of bones that have been thrust into the cavities of other bones. Again, hominid involvement could be invoked, although in a densely packed mass of 100 000 bone pieces, or more, the chance of certain bones entering the cavity of others must be considered.⁶⁰



Ironically, Brain was to discover some tools of his own. He and a colleague, Pat Shipman, were able to establish, through the use of an electron microscope, that several bone flakes and horn cores from Swartkrans had almost certainly served as digging tools. Some, showing a 'superimposed polish', were likely used in the preparation of animal skins. Even a horse mandible was later identified, one end of which had been 'extensively used' for digging—the tooth-row, presumably, providing a firm grip for the task.⁶¹ And then, as if to consolidate these findings, the hand bones of *Australopithecus robustus* were discovered at Swartkrans.

R. L. Susman, doctor of evolutionary anthropology and an authority on functional morphology, makes the following assessment on this discovery in an article that appeared in the journal *Science*:

Earlier assertions that Paranthropus [robustus] was not a toolmaker or user were not based on anatomical evidence. Earlier morphological and comparative evidence consisted mainly of assumptions about the relation between brain volume (and intelligence) and cultural capacity. There were no fossils and, thus, there could be no discussion of relevant, diagnostic fossil evidence. The new Member 1 [Swartkrans] hand fossils indicate that the hand of Paranthropus was indeed "hominized". The human-like first metacarpal, the human-like first distal phalanx with its broad apical tuft and flexor pollicis longus insertion, and the short, straight fingers indicate that the robust australopithecines had much the same morphological potential for refined precision grasping and for tool behaviour as do modern humans.⁶²

The hand of *robustus* was human.

One wonders what Dart would have made of this—of the fact that Brain himself had identified tools of bone, horn, and tooth. He passed away in 1988, unfortunately, only months after the appearance of Susman's paper, and with him was laid to rest his osteodontokeratic culture. Henceforth, the focus would be on the *digging* skills of the man-apes and their innovation in finding tubers.

The anthropologist Ashley Montagu once made the comment that Dart's conclusions have "an uncanny way of turning out to be right in spite of all the experts' disagreement."⁶³ Today, after a barrage of criticism, it is undisputed that the man-apes used tools. Indeed, it has since been established that stone tool usage predates *homo*, and the most likely candidate is none other than *Australopithecus* himself. In Kenya, stone tools have been discovered dating back 3.3 million years—a million years before *Homo habilis*, the 'handy man'.⁶⁴ In Ethiopia, bones were discovered bearing 'unambiguous evidence' that the meat had been carved off using stone tools 3.4 million years ago—a time contemporaneous with 'Lucy', the *afarensis* specimen that Marzke examined.⁶⁵ One of the archaeologists involved in this discovery, Dr Shannon McPherron, makes the following comment regarding the find: "Now, when we imagine Lucy walking around the east-African landscape looking for food, we can for the first time imagine her with a stone tool in hand looking for meat."⁶⁶

This is quite the antithesis of the image of a tuber-digging hominid and resonates with Dart's own interpretation of the lifestyle of the man-apes; albeit he would have envisaged a bone-wielding biped. What this brings to the fore is the question of the validity of his arguments. For a hypothesis that has been denounced as false and relegated to the history books, he certainly

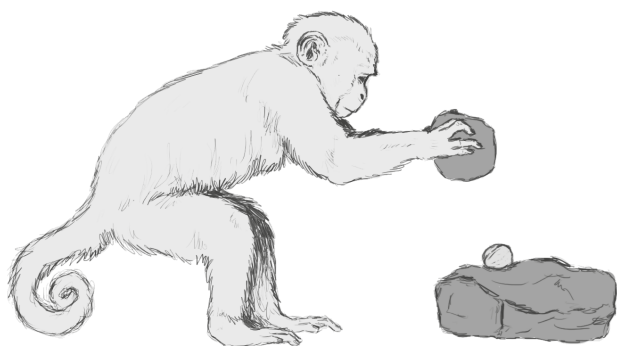
was ‘uncannily’ close to the mark on several issues. What has become of his research? What has become of the bones that were indented on one side only and the horn-cores that had been forcibly thrust into the cavities of larger bones? Were these modified by hominid hands or not? As Phillip Tobias demanded when describing stalactites and stalagmites that had been broken from their deposits and then fragmented longitudinally, “Where is the carnivore that indulges in such behaviour?”⁶⁷

It is unfortunately the case that Dart’s obsession with the cultural artefacts of the australopithecines has muddied the waters, so to speak. Today, the approach seems to be that his ‘elaborate bone culture’ is best left alone—for fear of being tarred by the same brush, no doubt. A consequence of this is that Dart’s weapon-wielding man-ape has suffered the same fate, despite the rationality of the idea. It’s hard to imagine Lucy, after all, wandering about in east Africa more than 3 million years ago without some form of protection. She ate meat ... she *was* meat. How did she manage without her fighting canines?

Bob Brain, in *The Hunters or the Hunted*, makes the observation that hominids are “changeable creatures.” The leopard, for instance, has remained largely the same for 2 million years, but not so the hominids, he emphasises: “*Homo habilis* was a very different animal from *Homo sapiens*, not only in the flexibility of its behaviour, but also in the traces of its former presence.”⁶⁸ That we are changeable can be no more evident than from our recent past. We’ve evolved from bone cracking savages to fine-dining jetsetters in a time span that defies belief. But this behavioural flexibility belies the fact that, in form, we differ but little from Lucy. The jaw has receded, and the cranium has become enlarged, but we’re still essentially the same creature with the same body, the same hands, and the same dental apparatus.

The real changes would have come about with our departure from the arboreal habitat. It is here, in all likelihood, that the enlarged canines lost their significance, and the most reasonable rationale in this regard is that the *hands* were being employed in the interactions that typically call upon the use of teeth. This would not have been feasible while clinging to branches for support, suggesting that this was in effect a terrestrial response. A firm footing was needed, of course, and the brachiating structure of the apes allowed for this while giving free movement to the arms. The pertinent question is, what gave the hands the advantage over fighting canines?

Dart, with his 'accustomed vigour', envisaged the gibbon whirling himself about the branches of trees while man whirls the branches of trees about himself.⁶⁹ This may be a whimsical metaphor, but it highlights the fact that the grasping attributes of the primates, once relieved of their climbing priorities, may be employed with equal dexterity in the use of objects on the ground. We find, for instance, that the long-tailed macaques of southern Thailand make regular use of stones to crush shellfish,⁷⁰ and in Brazil the bearded capuchin is equally adept in using stones to crush the nuts of the tucum palm.⁷¹ Tool usage among the higher primates is in fact relatively common, which goes to show just how versatile the grasping attribute really is. Indeed, our cousins the chimpanzees have taken things to a whole new level and in Senegal are known to sharpen a stick with their teeth, which is then used to *spear* bush babies that lie in hiding in the hollows of trees.⁷² Clearly, they have stumbled upon a means to circumvent the use of the canines.



Dart, as early as 1934, argued that the absence of enlarged canines in *Australopithecus* indicated “an increased use of the hands and a capacity for suitably selecting and accurately employing natural objects as tools and weapons.”⁷³ In his opinion, it was the “carnivorous habit” that led the way to hominization,⁷⁴ and if the Senegal chimpanzees are anything to go by, he may have been right on the mark.

Stabbing a bush baby with a stick is a far cry from hunting down a deer, of course. The Senegal chimpanzees still have a *long* way to go before making such an attempt, and in order to get there, they will have to continue honing their predatory skills—skills, however, that they will need to develop within their own ecological boundaries. Chimpanzees prey on other primates for a reason—it’s within their range of capabilities. And it follows that in fulfilling the ‘carnivorous habit’ that their choice of prey will continue to be primates—until such time, at least, that they have become sufficiently accomplished to target terrestrial animals. The ‘carnivorous habit’, in other words, may ultimately lead to their own hominization.

From this perspective, one could argue that hominization may in fact reflect the specialisations of a

primate-hunting ape and, by implication, that the emerging hominids of our own lineage may have been precisely that—primate hunters. Dart, from the onset, was very vocal about the hunting prowess of the man-apes, insisting that they had hunted baboons—even one another. We know how that went. What is of particular interest in this regard is that C. K. Brain himself raised the possibility that a “specialised predator of primates”⁷⁵ could have been involved in the bone accumulations. At the site known as Sterkfontein *Member 4*, for instance, he had identified the bones of 348 individual animals, of which 243, or sixty-nine point eight percent, were primates.⁷⁶ At Swartkrans *Member 1*, primates represented fifty-two point nine percent of a total of 339 animals,⁷⁷ and at Kromdraai *B*, again, forty-one point one percent (or forty-three of 104 individuals) were primates. This number could have been substantially higher considering that several hundred indeterminable cercopithecoid (Old-World monkey) bone fragments were not included in the final tally.⁷⁸

In the closing chapter of *The Hunters or the Hunted*, Brain comments as follows:

On the basis of evidence presented in earlier chapters, I have been led to the conclusion that the australopithecine remains found in the three Sterkfontein valley caves were not from animals that went voluntarily to the sites to die. They came, rather, from hominids that had been taken to the caves by carnivores and eaten there, the fossils representing discarded food remains. I believe the same is true of the cercopithecoid remains that are abundantly associated with those of the australopithecines. If this interpretation is true, we have to account for the deaths of the following primate individuals represented in the three site units:

Sterkfontein *Member 4*: Australopithecines, 47 individuals (17 subadult); cercopithecoids, 198 individuals (± 29 subadult).

Swartkrans *Member 1*: Australopithecines, 87 individuals (58 subadult); cercopithecoids, 89 individuals (27 subadult).

Kromdraai *B*: Australopithecines, 6 individuals (6 subadult); cercopithecoids, 37 individuals (17 subadult).⁷⁹

This “remarkable state of affairs,” as he refers to it elsewhere,⁸⁰ could, in his opinion, be accounted for if the three cave sites had “served as lairs for specialised predators that hunted baboons and hominids to the virtual exclusion of other prey.”⁸¹

Leopards could be discounted, as many of the animals represented in the assemblages were too large to be considered their prey. Besides, monkeys and baboons typically form a small part of their diet. Extinct hunting hyenas were a possibility, but too little was known about them to make a determination. The most likely candidates, Brain believed, were the large, sabre-toothed cats and, in particular, the false sabre-tooth *Dinofelis*, whose dental composition was more suited for the task.

The possibility that more than one primate-hunter was involved should not be ignored, cautioned Brain, and the likelihood that the primates used the caves as sleeping sites should also be taken into account—they could well have been killed on site by an opportunistic, nocturnal carnivore.

By omission, Brain thus concludes that Dart’s “predatory, cannibalistic australopithecines”⁸² were the *hunted*, not the *hunters*.

4

A QUANDRY OF BONES

*Did I request thee, Maker, from my clay to mould me man?
Did I solicit thee from darkness to promote me? —John
Milton (Paradise Lost)*

The New York Times of June 23, 1981, featured an article titled “Prehistoric Man’s Killing of 90 Giant Baboons Suggests Early Ritual”. In what was referred to as one of the “most provocative anthropological findings in recent years,” the precursors of modern man had allegedly butchered dozens of extinct gelada baboons at a site in Kenya. The article goes on to say that “all the baboon specimens were found to have their heads smashed.”¹

The site, Olorgesailie, once on the shores of an ancient lake in the Eastern Rift Valley, is noted for the thousands of stone artefacts left behind by Early Stone Age hominids. One particular location designated as DE/89 B, where the baboon remains were concentrated, was considered by a team of researchers to be a probable butchering site used intermittently by hunter-gatherers. Careful analysis of the bones had revealed a distinctive pattern of breakage and joint disarticulation not consistent with carnivore activity, and on this basis, they concluded that the hominids at Olorgesailie were “apparently selecting giant geladas as prey in prefer-

ence to the bovids [horned animals], equids [horses], and suids [hogs].”²

How the hominids managed this, considering that the extinct baboons were twice the size of their present-day counterparts and undoubtedly as ferocious, is anyone’s guess, but a blow to the head seemed likely, which would have been consistent with the baboon hunting practices of the Hadza people living across the border in Tanzania. The lingering question was, *why* did they do it? Surely less formidable prey was available?

Not everyone agreed with the findings, of course. *Scavenging* hominids could have been involved, using the same methods of disarticulation. The baboons, for that matter, may have drowned, with their bodies ending up where they did as a result of water activity. Weathering and trampling underfoot also couldn’t be ruled out, not to mention that a myriad of creatures would have been interested in the leftovers. The only factor that “unequivocally identifies hominids as the agent of breakage,” the team admitted in a research paper on the subject, “is a cutting mark.”³ And, unfortunately, there was no evidence of this in the case with the giant geladas.

In Spain, to the south of the Cantabrian Mountains which straddle the northern coastline of the country, lie a series of hills called the Sierra de Atapuerca. Here, towards the turn of the twentieth century, a railway line was cut for the transportation of ore exposing sediments that, after subsequent excavations, revealed a landscape so rich in fossil *fauna* that the area was later declared a world heritage site. The faunal remains unearthed at different excavation sites include elk, bison, mammoths, rhinos, hippos, lions, bears, wolves, boars, beavers—the list goes on, painting a picture of wooded surroundings complemented by an abundance of water.

One such site, named the *Gran Dolina* or ‘great pit’, was once occupied by hominids that left behind tools fashioned from quartz and limestone. Mixed together

with the tools were the skeletal remains of a variety of animals, a large portion of which revealed striations, or cut marks, associated with the de-fleshing of bone. These particular remains, needless to say, unequivocally represented the leftovers of hominid meals.

Among the *fauna* that ended up this way were a number of primate individuals, their bones having been manipulated and discarded in the same manner as the other prey species: “Cut marks (slicing, chop, and scraping marks) on the cranial segment are abundant on the base of the temporal bones, face, and zygomatic [cheek] bones,” a team of researchers revealed in an article that appeared in *Current Anthropology*. “On the limbs we found cut marks and bone breakage by percussion and bending.”⁴ The remains, dated at more than 800 000 years old, happened to be those of a biped. To wit, the victims were identified as members of the genus *Homo* and named *antecessor*, or pioneers, in reference to their being the oldest known humans to have arrived in Europe. No other hominids are known to have occupied the continent at this time, suggesting that *antecessor* must have been both the hunter *and* the hunted.

The Gran Dolina discovery is recognised as the oldest confirmed case of cannibalism among hominids. Evidence suggesting that the practice may extend further back into the past has been presented, but the standards set are of such a nature that consensus is not easily reached. Renowned anthropologists Pickering, White, and Toth, for instance, have argued that *Stw 53*—a 1.5-million-year-old partial cranium of *Homo habilis* from South Africa—bears the hallmarks of anthropogenic (human-related) disarticulation. An abstract of the Paleoanthropology Society Meeting held in Ohio in 1999 notes as follows:

Stone tool cut marks on *Stw 53*, a Plio-Pleistocene hominid partial cranium from Sterk-

fontein Member 5 (Gauteng, South Africa), constitute the earliest unambiguous evidence that hominids disarticulated the remains of one another. The position of the cut marks – a pattern that has been observed on a wide range of butchered mammalian species – is consistent with incision of the masseter muscle, presumably to remove the mandible from the cranium.⁵

The jury is still out on the matter, however. An article that appeared in the French journal *Bulletins et Mémoires* in April 2018 argued that non-anthropogenic processes can mimic cut marks on bones. A series of butchery and trampling experiments led the authors to conclude the following:

... based on statistically supported morphological comparisons of macro- and microscopic observations, our results allow us to interpret the linear marks present on the early Pleistocene hominin cranium *Stw5* as trampling marks rather than cutmarks modifications. Based on these results, *Stw 53* would not exhibit the earliest unambiguous evidence of anthropic modifications on hominin remains.⁶

Antecessor thus retains the title of being the oldest known cannibal in the archives of human evolution, but by no means was he the only one. In 1976, at a location known as Bodo D’ar in the Awash River valley of Ethiopia, members of an expedition in search of ancient artefacts discovered the partial cranium of an archaic human species dated at 600 000 years old. No less than seventeen cut marks were identified on the specimen, including slice marks in the eye sockets, indicating that “intentional post-mortem de-fleshing of some kind occurred,” according to anthropologist Tim White who was personally involved in the cleaning and reassembly

of the various parts. In a paper on the subject, he remarks this:

It is possible for dry modern or fossil bones to be scored by agents such as stones or hooves which may, in some instances, mimic stone-tool cut marks (White, 1985). The distribution (patterning and intraorbital placement), morphology, and dimensions of the marks on the Bodo cranium effectively eliminate this possibility as well as the possibility that the marks were made by abrasive particles in the sedimentary matrix prior to fossilisation. In addition, none of the hundreds of other fossils from this sedimentary unit examined during the 1981 fieldwork showed such marks.⁷

A correlation between the unusual feeding habits of the Gran Dolina hominids and the Bodo D'ar specimen, in other words, is undeniable, and this despite not only 200 000 years but entire continents setting them apart. Indeed, in France, some 500 kilometres due east of Gran Dolina at a site close to the village of Tautavel, the butchered remains of *Homo erectus* have been discovered, which indicates that the practice probably persisted 400 000 years after the *antecessor* evidence.

'La Caune de l'Arago', or simply the Arago Cave, is a large limestone cavity set in the foothills of the Eastern Pyrenees. Here, in deposits dating from 550 000 to 400 000 years ago, the remains of thirty *erectus* individuals (eighteen adults and twelve children) were unearthed.⁸ Excavations spanning five decades revealed that, as at Gran Dolina, their bones were discarded among the remains of animals that were consumed, some having been broken when still fresh, while others displayed the tell-tell signs of anthropogenic de-fleshing.

The Arago hominids, or *tautavelensis* as the type specimen is now called, could well be ancestral to the

Neanderthals who appear in Europe some 250 000 years later, but this remains to be seen. What can be confirmed is that the practice of cannibalism was handed down to the Neanderthals and was a feature among them until their extinction *circa* 40 000 years ago.

It was in fact the Neanderthals that brought the first evidence of prehistoric cannibalism to the fore. Back in the day when Neanderthal bones were still considered the remains of a tribe of 'Flat Heads',⁹ the pioneering palaeontologist Dragutin Gorjanović-Kramberger initiated excavations at a site on the outskirts of Krapina in northern Croatia, where he had discovered a molar belonging to one of these archaic humans. Fieldwork conducted from 1899 to 1905 subsequently produced the remains of more than twenty individuals, their bones found scattered among the remains of game animals that had been butchered at the site. Cut marks on the bones of the hominids left little room for doubt that they had suffered the same fate, and Gorjanović-Kramberger consequently concluded that the long bones of the Neanderthals had been broken to get to the marrow and the heads smashed to access the brain.¹⁰

Occupation of the site is dated at 130 000 years ago, which makes it the oldest known incidence of Neanderthal cannibalism. This claim has not been without its share of controversy, with some having argued that rock falls could have caused the breakages and others that the flesh may have been removed in preparation for internment. Contemporary evidence has, however, come out in support of Gorjanović-Kramberger's hypothesis, and a number of European sites have since revealed that the Neanderthals did indeed practice cannibalism.

In southeast France, at a cave site named Moura-Guercy, for instance, the bones of at least six Neanderthals were identified that showed signs of anthropogenic modification. Comparative analysis of

the animal and human remains recovered, using an electron microscope, revealed that they had been processed in a similar manner. "If we conclude that the animal remains are the leftovers from a meal," Alban Defleur, one of the researchers, commented at the time, "we're obliged to expand that conclusion to include humans."¹¹

Their findings, published in the journal *Science*, provide an interesting insight on the subject:

Anatomical assessment of the hominid bone modification leads to an understanding of the butchery practices used. For example, all three Neanderthals represented by the distal clavicle display cut marks on the lateral inferior surface of this bone, indicating disarticulation at the shoulder. In at least one individual each, the Achilles' tendon, pedal phalangeal [toe] flexor tendons, and tendon of brachialis [upper arm muscle] were cut transversely at the ankle, metatarsophalangeal [toe knuckles], and elbow joints, respectively. The temporalis muscle was removed from two of the immature cranial vaults. Cut marks on the lingual surface of the juvenile mandible show that the tongue was cut out. Cut marks on the femoral shafts show that the thigh musculature was removed.

These bone modifications indicate that the human individuals were defleshed and disarticulated. After this, the marrow cavity was exposed by a hammer and anvil technique.¹²

An intriguing feature of the deposit, considering that the Neanderthals can be added to the list of prey, is that they represent the most consumed species at Moula-Guercy, surpassing the number of red deer killed.

In neighbouring Spain, deep inside the Cueva de El Sidrón, a cave network not far from the Bay of Biscay, explorers in 1994 discovered the bones of what would

prove to be thirteen Neanderthal individuals, comprising men, women, and children. More than 2 500 skeletal remains were recovered from the assemblage, of which a mere fifty-one pieces turned out to be of non-human origin.¹³ The evidence was unequivocal—the bodies had been de-fleshed and disarticulated with nutritional intent.

To the south of Spain, near the village of Zafarraya, excavations at the *del Boquete* cave have yielded the bones of at least seven adults and two infants that were processed for consumption. Here, human tooth marks were identified on some of the remains as well as bones that had been exposed to fire. In France, the site called *Les Pradelles* produced the cannibalised remains of five individuals—three adults, an adolescent, and an infant. And in Belgium, again, four adolescents and one infant met the same fate in the *Troisième Caverne* at Goyet.¹⁴

At around 40 000 years ago, the Neanderthals disappear from the fossil records, roughly concurrent with the arrival of early modern humans in Europe. Whether they were displaced or assimilated is unclear, but they do live on as a small contribution to the human genome—the highest percentage of which is in the northern hemisphere—indicating that some interbreeding did take place. The practice of cannibalism didn't end with their demise, however. The newcomer, Cro Magnon Man, named after the location of the first discovery in 1868, turned out to have had the same gastronomic tendencies.

Anatomically modern, albeit more robust than their present-day descendants, these early Europeans are associated with the Upper Palaeolithic or Late Stone Age, *circa* 50 000 to 12 000 years ago. They're well known for their elaborate cave art and the Venus figurines depicting obese females, and in some cases, they buried their dead with adornments. Lesser known

perhaps is the fact that they also fashioned drinking cups from human skulls.

In Gough's Cave near Bristol, at a time when England's ice sheets were retreating and the English Channel could be traversed by foot, five early migrants into the area were devoured by fellow humans, their remains ending up among the leftovers of butchered animals. Three of them, including a young child, had their skulls modified to serve as receptacles. "The skulls were scrupulously cleaned of soft tissue shortly after death," Silvia Bello of the Natural History Museum in London explains. "Marks show cutting of the lips, cheeks, and tongue and extraction of the eyes. Then the bones of the face and the base of the skull were carefully removed. Finally the cranial vaults were meticulously shaped into cups."¹⁵

Dr Bello, a researcher in the Department of Earth Sciences, elaborates on the find in a paper published in the *Journal of Human Evolution*:

Our present analysis [2015] of the postcrania has identified a far greater degree of human modification than recorded in earlier studies. We identify extensive evidence for defleshing, disarticulation, chewing, crushing of spongy bone, and the cracking of bones to extract marrow. The presence of human tooth marks on many of the postcranial bones provides incontrovertible evidence for cannibalism.¹⁶

Radiocarbon dating has established an age of 14 700 years for the remains, which happens to correspond with the timeframe of four human bone fragments recovered from Hhle Fels, a cave site in Germany's Swabian Alps. While scant in number, these remains all display evidence of anthropogenic modification, including striations, percussion fractures, and intentional breakage.¹⁷ No tooth marks were found, which is not

surprising considering the scarcity of the remains. What this means, however, is that ritual modification of the remains can't be ruled out, and in the absence of more substantive evidence, cannibalism at Höhle Fels thus remains inconclusive.

Not so at Brillenhöhle, a mere four kilometres away. Here, bite marks and tooth scores are clearly evident on five of the forty-one human fragments recovered from the site's Magdalenian level around 12 000 years ago. At least three individuals were butchered here along with a significant number of macro *fauna*, several bones of which display the same tooth marks indicative of human consumption. There has been considerable debate over the human element of the deposit, with some arguing in favour of cannibalism and others again interpreting the evidence as being consistent with secondary burial, where de-fleshing of the corpse is involved. Researchers Sala and Conard, however, following a recent examination of the material in 2016, feel that there is "little room for doubt about the objective of the anthropic modification." They concluded the following in a paper on the subject:

The taphonomic analysis carried out on both new and old finds indicates that the assemblage displays butchering similar to those reported for the non-human faunal remains (mainly *R. tarandus*) [reindeer] and includes: skinning, defleshing, evisceration and disarticulation. In addition to the cut marks, intentional breakage has been documented in the form of percussion marks and peeling. The association of these anthropic traces with human tooth marks leads us to conclude that the consumption of human corpses took place during the Magdalenian in Brillenhöhle.¹⁸

By 11 700 years ago, the Ice Age was over, ushering in the Holocene—the current epoch also known as the

Age of Man. This era is noted for the transition from hunter-gatherer to the more sedentary lifestyle of the nomadic pastoralist. Here, the aeons-old lithic industry came to an end with the introduction of metals, and in the warmer latitudes, the tending of crops became a feature. Population growth led to the formation of extensive tribes, some of which live on in our folklore, and new innovations ultimately produced the wheel and the written word.

This epoch represents *us*, in other words, and the fossilised remains those of our direct ancestors, not some obscure antiquated hominoid species. It would be nice, therefore, to imagine that cannibalism was a thing of the past.

Alas, this is not the case. On the contrary, the Holocene seems to have added a whole new dimension to the practice. At a Stone Age settlement in Herxheim, Germany, for instance, more than a hundred individuals were cannibalised. Indeed, excavations carried out from 2005 to 2010 indicate that as many as 1 000 victims may have met their end there, based on the unexcavated remainder of the deposit. With less than ten percent of the estimated remains recovered, sixty-one adults and forty-three immature individuals were identified that had been processed for consumption. Meticulous analysis of the remains has led researchers Boulestin and Coupey to suggest that the bodies may have been roasted whole, face down, and then processed by first removing the spine. The remains were then left in ditches which were soon covered up, as evidenced by certain bones that never had the chance to settle to the bottom (this reminds of the pit oven roasts of the latter-day cannibals, which will be dealt with later). Most of the crania were converted to skull cups, perhaps to facilitate the eating of the contents, and then discarded in small heaps or ‘nests’ along with the rest of the leftovers.¹⁹

This episode took place 7 000 years ago when leaf-shaped flint blades and stone axes were still in vogue. It was a violent time by all indications, and a number of mass burial sites of the period have been discovered, albeit not of the same magnitude. The site that comes closest to this is Schletz-Asparn near Vienna, where excavations have identified sixty-six brutally slain victims in a deposit that may contain as many as 300 individuals.²⁰ There is no evidence to suggest that the dead were cannibalised, however. The massacre is attributed to inter-tribal conflict or warfare, and if cannibalism was involved, it was not at the site of the killings.

Several less-imposing deposits nonetheless attest to continuation of the practice throughout the Holocene. In France, for example, eight individuals were consumed at a site called *Grotte Perrats*. In Spain, thirty ended up the same way at Malalmuerzo, and at Las Majolicas, the figure stands at forty-two.²¹ These are just a few of the confirmed cases, and in addition to these, a good number of sites remain in contention, lacking the conclusive evidence necessary to determine whether the dead were processed for consumption or for secondary burial (ritually de-fleshed).

Clues to the universality of the phenomenon come from an unexpected source once the Stone Age comes to an end. Diodorus Siculus, the famed author of *Bibliotheca Historica*, a forty-volume history of the ancient world compiled in the first century BC (of which several volumes have been lost), relates the following concerning the origin of the Egyptian gods:

Osiris was the first, they record, to make mankind give up cannibalism; for after Isis had discovered the fruit of both wheat and barley which grew wild over the land along with the other plants but was still unknown to man, and Osiris had also devised the cultivation of these

fruits, all men were glad to change their food, both because of the pleasing nature of the newly-discovered grains and because it seemed to their advantage to refrain from their butchery of one another.²²

Strabo, an affluent Greek from first century BC Asia Minor, who travelled extensively throughout the ancient world, has this to say about the British Isles in his historical work *Geographica*:

There are also other small islands around Britain; but one, of great extent, Ierna, lying parallel to it towards the north, long, or rather, wide; concerning which we have nothing certain to relate, further than that its inhabitants are more savage than the Britons, feeding on human flesh, and enormous eaters, and deeming it commendable to devour their deceased fathers, as well as openly to have commerce not only with other women, but also with their own mothers and sisters. But this we relate perhaps without very competent authority; although to eat human flesh is said to be a Scythian custom; and during the severities of a siege, even the Kelts, the Iberians, and many others, are reported to have done the like.²³

“Devouring their deceased fathers” may seem a little over the top, until, that is, we find that Herodotus—the ‘father of history’—mentions the same practice among the Issedones of northwestern Asia:

It is said to be the custom of the Issedones, that whenever a man’s father dies, all the nearest of kin bring beasts of the flock, and having killed these and cut up the flesh they cut up also the dead father of their host, and set out all the flesh mingled together for a feast.²⁴

The Kallatiai to the south of the Indus River are said to have done the same, as did the Padaioi, a nomadic people of the region who apparently preferred their meat raw.²⁵

We could go on, learning from the historian Apollodorus how Tydeus, one of the champions in the saga *The Seven Against Thebes*, “split open the head and gulped up the brains” of Melanippus, his adversary.²⁶ Or how, according to the historian Cassius Dio, the Bucoli people of Egypt swore an oath over the entrails of a Roman centurion and then proceeded to devour him.²⁷

The point has however been made that cannibalism has been around for a considerable portion of our collective past, and as we shall see in the succeeding pages, cannibalism was not confined to just the northern hemisphere. The Age of Discovery produced a wealth of first-hand accounts of the practice where it still persisted, without which we would have been oblivious to a past that may well have influenced our development as a species.

Indeed, it may have defined who we are.

5

NATURAL INSURRECTION

... with respect to {seemingly} natural impulses, I have observed when the question related to the choice of right or wrong action, that they frequently led me to take the worst part. —Descartes (A Discourse on Method)

Of the antagonism of Man towards Man there can be no question. Our legacy is one of violence, particularly towards our own kind. Our histories, our myths, and our archaeological past all bear testimony to this. The present affirms it as a glaring reality.

Our young daughters, on the whole, are attracted to dolls and the nurturing role that goes along with them. Our sons, on the other hand, are enthralled by weapons. Be it a slingshot, a makeshift sword, or a toy gun, boys the world over share the same fascination for the items of combat. And just as girls later discard their dolls in favour of a child of their own, so do boys eventually deal with real weapons that will kill.

In the animal kingdom, young at play rehearse their future roles as adults according to their own particular survival requirements—in general, deer will practise bolting, cats stalking and pouncing, and dogs the cooperative hunting of the pack, whether going after a ball or a lizard. Young males of our own species, on the other hand, typically simulate killing *one another*, be it with their toys or under instruction at a fight club. And

just as the playful sudden bolt of a young deer is crucial to its continued survival, equally so the fighting prowess of our boys is integral to our own survival.

It may seem a contradiction in terms—boys learning to kill humans for the sake of human survival—yet it is the killers that ultimately survive. The Vikings didn't sweep across Europe negotiating their way, and nor did the Mongols in Asia. In more recent times, the Zulus laid waste to southern Africa, 'washing their spears' in the breasts of their enemies as they did so.

When the killing is done, it is the killers that remain. And when the killers are confronted by other killers, the fierce remain. And then the fierce ultimately square off against the equally fierce ... where does this lead to? Today, certain males of our species are born with an extra chromosome and, though quite normal in other respects, as adults are prone to become "unusually tall and unusually aggressive."¹ Could this be an indication of what the selection process has in store for us? Will our intra-specific antagonism in the long run favour the more brutal aspects of our nature? Indeed, we could ask if it hadn't already done so.

This facet of our existence makes for the most extraordinary investigation into the evolution of species. Somewhere in our past, a process was set into motion that subjected humankind to the fiercest survival struggle imaginable. The results are clear to be seen. Literally thousands of wars have been fought throughout our recorded history, with every war consisting of countless battles, not to mention that tribal skirmishes have been the order of the day since time immemorial. Countless communities have been subjected to the threat of total annihilation. No troop, group, tribe, or nation, in all likelihood, has been spared the phenomenon of human-on-human violence. Ownership of this planet belongs to the killers, and if we were to look for those who chose the peaceful way *and*

survived, our efforts should perhaps be focused on our cousins the chimpanzees and gorillas.

Along with this violent process, nobler traits such as bravery and self-sacrifice developed and, thankfully, an increase in awareness. By some quirk of fate, the most profound consequence of our violent existence—intelligence—may ultimately be the instrument that brings it to an end. As Darwin, when considering the primitive practices of Man, eloquently put it, "... what an infinite debt of gratitude we owe to the improvement of our reason, to science and our accumulated knowledge."²

Now, with the accumulated knowledge of our past, we of the twenty-first century need to take a brave new look at precisely who and what we are. How do we fit into the greater scheme of things? Was Wallace right all those years ago when he argued that natural selection fell short of explaining the existence of Man? With the birth of our species, did natural selection make allowance for an as yet undefined process of evolution?

Judging by our unique development, in that we wantonly kill one another (warfare being the most blatant aspect) and have been doing so throughout our recorded history, natural selection, as we've come to understand it, may well have been superseded by a 'more rapid' process of change. A process where, essentially, hunter is squared off against hunter, where cunning and ferocity rather than fleetness of foot and wing have the upper hand. A process somehow out of place in the order of things and yet, as testified by our very existence, a natural phenomenon. A process we could refer to as *natural insurrection*.

Allow me to elaborate.

The interaction between predator and prey is one of corresponding adaptations. Should the deer develop a faster bolting action, the feline predator must develop a better pouncing action. If bats learn to locate moths in the dark by interpreting the effects of sound waves,

then moths must learn to interpret those same sound waves in order to avoid the bats. If owls, snakes, cats, and hawks score high successes against mice, then mice must adapt by reproducing in larger numbers. This is the natural outcome of the survival process. But what were to happen if, for instance, lions were to prey on lions? Who then becomes the 'bolter' and who the 'pouncer'? Where does one draw the line between the hunter and the hunted if both parties consider one another a potential meal? How would natural selection respond to this?

What is being alluded to here, of course, is cannibalism. *Predatory delinquency*, we have seen, argues that cannibalism may have a natural bias. Under certain circumstances, animals may turn upon their own kind for a meal. It makes sense, after all (disregarding the long-term consequences), to prey on one of your own kind when faced with hunger. Where this does occur in nature, it typically involves infants and juveniles, who are not only the more accessible prey but also the more expendable.

The list of perpetrators is quite extensive—from tadpoles to whales, in fact—with the New Zealand (or Hooker's) sea lion joining the ranks of the delinquents as recently as 1999, when males were observed eating the young of their own kind.³ By definition, however, *predatory delinquency* should serve merely as a catalyst to ultimately produce fully-fledged carnivory. Taking the Hooker's sea lion as an example, its diet of mainly fish and squid—which is now being augmented by the inclusion of mammalian flesh—should, over time, evolve to include a more diverse range of aquatic mammals. Having come to the realisation (as a consequence of cannibalism) that aquatic mammals are an available food source, the Hooker's sea lion could, in the not-too-distant future, start preying on the pups of seals and walruses instead of its own young.

This brings us to the question of Man. The indications are that we originate from just such a delinquent species. And while we clearly prey beyond the boundaries of our gene pool, we only recently gave up hunting *within* our gene pool. In fact, we're still at it to this day when taking murder and warfare into consideration. Insofar as the principles of survival are concerned, this is completely at odds with the impetus to disseminate the gene pool. Logic suggests that intra-specific predation cannot be sustained and must be abandoned if those involved are to survive. Where it endures and triumphs, as in our case, then the deduction can be made that we are dealing with a revolution, in evolutionary terms.

Mankind, in other words, is the subject matter of *natural insurrection*.

This opens up an array of questions regarding our own peculiar behaviourisms. How much of our nature may, in fact, reflect a cannibal past? Warfare and gang violence can be considered the residue of just such a background, but what are we to make of child molestation, rape, and murder? Are these the actions of the mentally deranged, or should we perhaps be looking at the perpetrators as those who simply cannot control their inherent human passions?

Within the context of this hypothesis, these would be the passions of man-eating men, and so, in order to come to some understanding of our latent impulses, these should become the subject matter of our inquiry.

Thankfully, cannibalism as a whole is a thing of the past. The practice reflects the most brutal aspects of human nature and is a subject that takes some getting used to. Much of it is mired in controversy and is given a wide berth by most sectors of society, with the result that information is not easily come by. The research of Garry Hogg has been invaluable in this regard, who painstakingly foraged through the archives of old

missionary societies and colonial offices to publish a comprehensive study on the subject back in 1966, called *Cannibalism and Human Sacrifice*.

The subject matter by and large dates back to the age of discovery, calling into question the credibility of the information that has been handed down. One should bear in mind, however, that many first-hand accounts were written by officials of the church and the state and that corresponding reports were coming in from across the globe. Garry Hogg, who must have worked his way through countless of these reports, certainly didn't express much doubt as to the authenticity of these accounts: "To read between the lines written with those spidery pens was a sobering experience," he mentions in his foreword. "More than one of the writers had just seen their wives and children brutally massacred and worse, and well knew that a like fate probably awaited them too – perhaps before their letters were delivered at the London headquarters of their missions."⁴

The fossil records affirm that the practice was once widespread, and from ancient texts that have been handed down to us, we learn the same. The Greek historian Strabo maintained that the ancient Irish practised cannibalism, and according to St Jerome, so did the Scottish,⁵ while on mainland Europe, the Celts purportedly sacrificed humans in religious observances.⁶ Indeed, the Greeks, Romans, Persians, Egyptians, Indians—the entire ancient world it would seem—practised sacrifice as a religious observance in one form or another. The biblical patriarch Abraham, many will recall, was prepared to sacrifice his own son, Isaac.

Marco Polo returned from travels in the east with tales of cannibalism among Tibetan and Chinese tribes, and the Spanish Conquistadors more recently witnessed the practice among the Aztecs of Mexico. With the age of discovery, travellers from as far afield as Canada, America, the West Indies, the Amazon, Peru, Hawaii, the South Pacific islands, Australasia, Indonesia, and

Central Africa reported the same macabre custom. Even the Eskimos of the far north are known to have eaten human flesh in times of famine.⁷

In our generation, cannibalism is simply considered a 'dark superstition' of the past, yet many a sailor, missionary, and explorer were once eyewitness to the stark realities of the practice. Surviving accounts, "much of it in the form of diaries and letters written by missionaries in ink that would often seem to have been homemade and on paper stained by damp, by seawater, [and] by rough handling,"⁸ provide a startling glimpse into a world which was diametrically alien to our own. One we may, in evolutionary terms, only recently have parted with.

It is the world of primitive man, isolated by vast oceans, impenetrable jungles, and malaria-infested swamps, where the 'corrupting' influences of higher cultures had left him largely unchanged—closely if not entirely 'wild' in the natural sense.

Sidney Langford Hinde, a captain in the Congo Free State Force, sketches a vivid background:

A man with his eyes open has no difficulty in knowing, from the horrible remains he is obliged to pass on his way, what people had preceded him, on the road or battlefield; - with this difference: that on a battlefield he will find those parts left to the jackals which the human wolves have not found to their taste; whereas on the road, by the smouldering camp fires, are the whitening bones, cracked and broken, which form the relics of those disgusting banquets. What struck me most, during my expeditions through the country [19th century Congo Basin], was the number of partially cut-up bodies I found. Some of them were minus the hands and feet, and some with steaks cut from the thighs or elsewhere; others had the entrails or head removed. Neither old nor young, women or

children, are exempt from serving as food for their conquerors or neighbours.⁹

One of the aspects of cannibalism by which one is immediately struck when delving into the subject is the casualness with which the human corpse was regarded. In hindsight, this is to be expected, but one is nonetheless awed by the depravity of it all. A report produced in 1866 by Hugh Hastings Romilly, the British crown's Deputy Commissioner for the western Pacific, makes this only too clear.

On my arrival in New Ireland there was a great sound of merry-making and laughter. On the branches of a big tree in the centre of the clear space were six corpses, hanging by their necks, their toes just touching the ground. After a long pull at my flask, I sat down, with my back to the tree, and watched the women.

They had made fires and were now boiling large pots of water. As soon as the water boiled, it was ladled out in coconut-shells and poured over the bodies one by one, after which they were carefully scraped with bamboo knives. This was simply the process of scalding and scraping that every dead pig goes through after it has been killed. The hair of the head was carefully cut off and preserved, to adorn some future headdress.

The women all this time were laughing and joking, discussing the points of each man. The whole thing was done in the most matter-of-fact way possible. When the bodies had been thoroughly scraped, nothing more was done until the return of the men of the village.

Then the business of evening commenced. A mat of plaited palm-leaves was laid down, and one of the bodies was cut down from the tree. A very old man, apparently the 'father' of the tribe, advanced into the centre of the crowd,

where an open space had been left to give him room to conduct his operations. He had five or six bamboo knives in his hand, and with his thumbnail he was stripping the fibres off their edges, leaving them as sharp as razors.

The body was then placed on the mat, and 'cleaned' – some of the more perishable parts being thrown to the women as one throws scraps to the dogs. These were barely warmed at the fire before they were devoured. The head was then cut off and carefully placed on one side, on a leaf.

In due course all six bodies were similarly prepared, and cut up into very small pieces. Each piece was carefully wrapped in a stout leaf and bound up tightly with sinnet. The thigh and shinbones, however, were preserved intact. They are used for making handles for spears.

When all six bodies had been cut up, the pile of little parcels wrapped in green leaves had assumed considerable dimensions. Then, the ovens were opened. The flesh was divided into as many parts as there were ovens, a little pile was put into each oven and covered over with hot stones. The bones and other parts that were not wanted were wrapped in mats and carried into the bush to be buried.¹⁰

Sir William Macgregor, Lieutenant-Governor of British New Guinea, was present at the return of a war party of New Guinea tribesmen:

When I examined their canoes I found that the marauders had captured some ten or twelve people. There were, in four separate canoes, four adult, undivided dead bodies. In another there was the body of a little girl of seven or eight, still tied by the hands and feet to the pole on which her tender body had been carried.

A village had been raided, and the canoes were full of plunder. A host of miscellaneous articles

had been collected, all of which were lying about in the canoes, with here and there a human hand protruding.

A nearer examination showed that the member had been detached, clumsily and unskilfully hacked from the body by an inexperienced hand, and that it was already half-cooked, probably to keep it longer sweet. On the platforms of the canoes were also little made-up parcels and packets of human flesh, deftly enveloped in leaves and tied with bark. On some of the platforms were large and small uncovered pieces, some cooked and ready for the table, others apparently the remains left over from an interrupted meal. One of these was a large portion of the back of a child, half-cooked, and corresponding exactly to what is known to the cook as a 'saddle'. In the holds of the canoes were coils of human intestines, sorted as one folds a fishing line, with a stick through the coil supporting it by resting on the edges of the canoe so as to let the coil fall into the hold but without the lower end reaching down to the bilge-water.¹¹

HUMANS AS FOOD

Only within the context of *predatory delinquency* could one rationalise such behaviour. For archaic Man, humans would simply have been the more accessible food source and human flesh looked upon as we do mutton or beef. The human corpse would have been butchered with the same indifference.

What is astounding is that this attitude survived well into the latter days of human self-awareness. One could expect the ritualised forms of cannibalism to embody an underlying sense of guilt and superstition. The basal form, on the other hand, where human flesh is consumed as standard fare, is characterised by an utter

lack of compassion and complete indifference towards the victim, reminiscent of a beast of prey.

Captain Hinde, mentioned earlier, tells of the following incident:

A young Basongo chief came to our Commandant while at dinner in his tent and asked for the loan of his knife, which, without thinking, the Commandant gave him. He immediately disappeared behind the tent and cut the throat of a little slave girl belonging to him, and was in the act of cooking her when one of our soldiers saw him. The cannibal was immediately put in irons, but almost immediately after his liberation he was brought in by some of our soldiers who said he was eating children in and about our cantonment. He had a bag slung round his neck, which, on examining it, we found contained an arm and a leg of a young child.¹²

One of the confounding problems that especially missionaries faced was that cannibal peoples couldn't quite comprehend the wrongs of their actions. "Why," asked a tribesman of the Rev. W. Holman Bentley working in the Congo Basin, "do you interfere with us? We do not trouble you when you kill your goats. We buy our meat, and kill it; it is not your affair."¹³

These words epitomise the mind of the cannibal. Human meat was considered good and available to whosoever desired it. Indeed, J. H. P. Murray, the Lieutenant-Governor in Papua, was confronted with such simplicity when asked "Why should I not eat human flesh?" A question for which, in the course of his career as Chief Judicial Officer, he couldn't come up with a satisfactory answer. In the minds of the people he dealt with, human flesh was provided by nature, to be consumed as any other flesh. One witness said in evidence: "We boil the bodies. We cut them up and boil them in a pot. We boil babies too. We cut them

up like a pig. We eat them cold or hot. We eat the legs first. We eat them because they are like fish. We have fish in the creeks, and kangaroos in the grass. But men are our real food.”¹⁴

An interesting account is that of a New Zealand chief who was brought to London in 1818 and resided there for a long time:

He confessed in his moments of nostalgia that what he most regretted in the country from which he was absent was the feast of human flesh, the feast of victory. He was weary of eating English beef; he claimed that there was a great analogy between the flesh of the pig and that of man. This last declaration he made before a sumptuously served table. The flesh of women and children was to him and his fellow-countrymen the most delicious, while certain Maoris prefer that of a man of fifty, and that of a black rather than that of a white. His countrymen never ate the flesh raw, and preserved the fat of the rump for the purpose of dressing their sweet potatoes.¹⁵

The analogies ‘Long Pig’ or ‘Great Fish’ were used among several peoples in reference to the human carcass, and worldwide, human flesh was considered to be the most succulent of meats. The comments of C. G. Seligmann, considered an authority on the Tribes of New Guinea, provide an interesting perspective in this regard:

Human flesh is stated to resemble pig in flavour, but to make much better food, since – although they both taste much alike – the former has the more delicate flavour, as well as the further advantage, claimed for it by everyone who can be persuaded to talk freely on the subject, that it never produces any feeling of

satiety, or induces vomiting. It has been emphasised by these people that if too much pig flesh were eaten, a man's stomach would swell up and he would be sick; but that human flesh might be eaten until a man found it impossible to swallow any more, without producing these unpleasant symptoms.¹⁶

This view was not restricted to New Guinea. The anthropologist A. P. Rice recorded the following victory celebration among the cannibal Fijians:

And such a feast! It consisted of 200 human bodies, 200 hogs, and 200 baskets of yams. The preparation of the human bodies and the hogs was identical, and every member of the tribe had of course to partake of the two main dishes – he was not allowed to select one or the other. This was to ensure that the men did not glut themselves on the human bodies to such an extent that there was insufficient human flesh and others would therefore have to contend themselves with mere hog flesh.

Some of the men did, in fact, attempt to concentrate their attention on the human flesh alone, but they were discovered and sternly forced to practice a less obvious form of greed. In fact, there was no evidence of a shortage of either commodity, but by the time the feast came to an end there was little remaining but bone.¹⁷

So esteemed was human flesh that, according to Rice, the women of the New Caledonian tribes “used to pick out the best covered corpses on the field of battle and dress them for the ovens while the warriors were still engaged in killing others.”¹⁸

One of the more gruesome accounts, suggestive of a pathological lust for human flesh, is brought to us by the Rev. John Watsford, reporting from Fiji in 1846:

I heard of an instance of cruelty the other day that surpasses everything I have before heard of the kind. A canoe was wrecked near Natawar, and many of the occupants succeeded in swimming to shore. They were taken by the Natawar people and ovens were at once prepared in which to roast them. The poor wretches were bound ready for the ovens and their enemies were waiting anxiously to devour them. They did not club them, lest any of their blood should be lost. Some, however, could not wait until the ovens were sufficiently heated, but pulled the ears off the wretched creatures and ate them raw.

When the ovens were ready, they cut their victims up very carefully, placing dishes under every part to catch the blood. If a drop fell, they licked it up off the ground with the greatest greediness. While the poor wretches were being cut in pieces, they pleaded hard for life; but to no avail: all were devoured.¹⁹

The Rev. Watsford, by his own account, received this information second hand, so one can allow for a level of fabrication and exaggeration. Certainly, tales such as this fall well within the ambit of cannibal behaviour, and one is left to ponder if such passionate desire for human flesh was indeed due to its culinary superiority. Fortunately, authorities on the subject are not freely available, but one might consider that the exaggerated lust for human flesh may have been psychological in nature—an expression of sentiment rather than gastronomic preference.

The statement by the New Zealand chief in London, to the effect that he longed for ‘the feast of victory’, perhaps says it all. For the cannibal, human flesh would by no means have been ordinary flesh. It would have represented, in some obscure way, the passion for life

itself, by virtue of the consumer not being the one that is consumed. The desire for human flesh, in other words, could in this context be interpreted as the desire to bring about the demise of the enemy and with it the threat of death to oneself.

Not surprisingly, cannibalism manifested itself as a superstitious cult involving fertility and longevity.

BLOOD LUST

Among males—those at the vanguard of inter-tribal conflict—one would expect the passions involved to be of a greater intensity. Typically, therefore, at the ‘banquet’ mentioned earlier by Rice, it was the males who exhibited the most greed for human flesh. The explorer John Dalton relates how the Dyaks of Indonesia, when preparing for a surprise attack on the enemy, could be so overcome with the lust for human flesh that one of their *own* followers could be eaten.²⁰

Despite his obvious aberration, cannibal man remains just another predator within the framework of evolution, and one thing shared in common among predators is a degree of enthusiasm—indeed, *enjoyment* in the chase. It is seemingly not enough to simply respond to hunger—although this is obviously the underlying motive—enthusiasm in the hunt, and ultimately the kill, has survived as the element most likely to appease that hunger. In what Konrad Lorenz terms the “over-production of tool activities,” dogs will continue “smelling, seeking, chasing, biting and shaking to death with equal enthusiasm whether hungry or not.” Similarly, lions may, on occasion, allow a young gazelle to escape their clutches, thus prolonging the chase despite the objective being to dispatch the animal. Lorenz cites a simple yet demonstrative experiment in this regard:

Leyhausen gave to cats which were keen hunters one mouse after the other and observed

the order in which the part actions of preying and eating disappeared. First the cat stopped eating but killed more mice, leaving them untouched. Next the killing bite disappeared, but the cat continued to stalk and to catch the mice. Later still, when the movement pattern of catching was exhausted, the cat still did not stop stalking the mice and indeed, in so doing, it always chose those farthest away in the opposite corner of the room, and ignored those that ran over its fore-paws.²¹

One is left to wonder how this phenomenon would manifest itself in the case of *intra-specific* predation. According to Lorenz, renowned for his knowledge of animal behaviour, “this energy, in the case of the instinct with which we are concerned – intra-specific aggression – may become very dangerous.”²² Indeed, if evolution has deemed it important for the dog to be enthusiastic when it shakes his prey to death, and for the cat to enjoy watching a mouse trying to escape its claws, then what are we to expect in the case of cannibalism? When predator and prey exhibit equal amounts of aggression, what then would be the nature of the surplus ‘tool activities’? One can hardly imagine, after all, a lion accustomed to hunting lions playfully tripping its prey for added sport.

Jens Bjerre, a Danish adventurer who spent some time with the notorious Kukukukus of New Guinea (the so-called ‘last cannibals’), tells of the following revealing incident:

I had bought one of their tame pigs, and asked the headman of the village, a young warrior by the name of Momakowa, to kill it for me. He was normally a calm, peaceable fellow, not without a certain natural dignity; but when he set about killing the pig with his club, the joy of slaughter shone in his eyes and he battered the

club again and again upon the head of the beast, although it had been killed by the first blow. He kept on till the blood spurted out; the children and women, who had gathered round him, screamed with delight.²³

Judging by accounts such as this, it becomes evident that intra-specific predation would encourage the development of an abnormal blood lust. Survival under these conditions would favour not only those with a total lack of compassion but specifically those that derive enjoyment from the kill. The dangerous surplus that Lorenz speaks of is in this context perhaps evident in the pleasure derived by the *suffering* of the enemy.

Alfred St Johnston, a traveller who lived among the cannibal Fijians, tells us of the following practice:

At Bau there used to be a regular display of slaughter, in a sort of arena, round which were raised stone seats for the onlookers. In this space was a large 'braining stone', which was used thus: two strong natives seized the victim, each taking hold of an arm and leg, and lifting him from the ground, they ran with him head foremost – at their utmost speed against the stones – dashing out his brains; which was fine sport for the spectators.²⁴

That the suffering of the enemy was considered 'sport'—indeed enjoyed—is vividly illustrated by the following report of the Methodist missionary Jagger, on the fate of two Fijian men captured in battle in 1844:

The men doomed to death were made to dig a hole in the earth for the purpose of making a native oven, and were then required to cut firewood to roast their own bodies. They were then directed to go and wash, and afterwards to make a cup of a banana-leaf. This, from opening a

vein in each man, was soon filled with blood. This blood was drunk, in the presence of the sufferers, by the Kamba people. Seru, the Bau chief, then had their arms and legs cut off, cooked and eaten, some of the flesh being presented to them. He then ordered a fish-hook to be put into their tongues, which were then drawn out as far as possible before being cut off. These were roasted and eaten, to the taunts of "We are eating your tongues!" As life in the victims was still not extinct, an incision was made in the side of each man, and his bowels taken out. This soon terminated their sufferings in this world.²⁵

It's difficult to conceive that incidents such as these could once have been a reality. Cruelty may still be a human peculiarity, but thankfully it is no longer a social preoccupation. What we may have to accept, however, is that this was once part-and-parcel of human existence and indicative of the immense survival pressures that our species was subjected to. No quarter could be given, under any circumstances. Those who thirsted to see the blood of their enemies spilled, who revelled in their suffering—their absolute defeat—were simply better equipped to survive.

Cruelty became particularly brutal in cases of retribution. C. G. Seligmann describes an incident where Wagawaga warriors return from a retaliatory mission with a captive Maivara man:

... the canoes returned triumphantly to Wagawaga, where the captive was pitched into shallow water, speared by as many warriors as could reach him there, and then dragged ashore. The greatest care was taken not to kill the captive at this stage, for it was necessary that he should be more or less severely wounded by the next-of-kin of the man for whom the revenge

was being taken. In this instance, the brother of the dead man, who was not a member of the war party, slashed him across the shoulder with a tomahawk. Even now, the victim was not killed; and if, as rarely happened, he was mortally injured, it was looked upon as a regrettable mishap.

The next stage was for the widow of the man for whom revenge was being exacted to blind the Maiha [the deputed culpable]. This she would do by thrusting pointed sticks into the victim's eyes, taunting him the while in some such terms as these: 'With your eyes you saw my husband killed; now will your eyes be no more use to you!' Then the dead man's sister's children spear the victim until he dies, and his body is then carved up by the men.²⁶

The Kukukukus, according to Bjerre, allowed their children to 'play' with a captive while the ovens were being prepared. First they would use the victim for target practice and then finally stone him to death in a process designed to "harden the children and teach them to kill with rapture."²⁷

The depravities reached are mind boggling. Captain Stewart, Master of the trading-brig *Elizabeth*, witnessed an old man, "from whose neck suspended the head of his son, while the body formed part of the cannibal feast, "being subjected to torture by women."²⁸ Another trader, Daniel Henry Sheridan, reported from New Zealand that, "They took the fatal tomahawk and put it between his teeth, while another pierced his throat for a chief to drink his blood. Others at the same time were cutting his arms and legs off."²⁹ A certain George Basden wrote of a Nigerian chief who "managed to get possession of one of his opponents against whom he had a grudge of long standing. He derived satisfaction from first lopping off his ears and nose, and afterwards

flaying him alive. The carcass was eaten, and the skin converted into a drumhead.”³⁰

There remains considerable controversy regarding the accuracy of reports such as these, of course. Zealous missionaries are suspected of having exaggerated the deeds of the ‘godless’, and, likewise, the travellers and explorers of yore may well have inflated their experiences. But this doesn’t detract from the fact that men such as judges, military officers, commissioners, anthropologists, etc., reported in very similar vein. Indeed, the correspondences observed across the globe can leave little doubt that events such as these may actually have occurred. To elaborate with even more grotesque accounts would serve little purpose, however. Suffice it to say that cannibalism, without the aspect of bloodlust, hardly seems conceivable. To embark on a course of intra-specific predation—*sustained* intra-specific predation—would inevitably result in abnormalities, and diabolical behaviour such as this can be considered a consequence.

WARFARE

Intra-specific predation, or in simple terms ‘hunting one’s own species’, conjures up images of stalking bow in hand from tree trunk to tree trunk, of inspecting traps to see if hominid is on the menu, and of luring ‘prey’ into ambush. But this doesn’t resonate with the level of bloodthirstiness with which the cannibals treated their ‘prey’.

Hunting is typically seen from the perspective of hunter versus prey. In the intra-specific context, however, the hunter may also end up becoming the hunted, which is an entirely unique set of circumstances. Heightened aggression is to be expected, but more profoundly, a total disregard for territorial boundaries would be the result. Hunters, for obvious

reasons, are not concerned with the territorial rights of their prey.

Among cannibal peoples, territorial integrity hardly existed. Cannibals invaded the territories of the opposition, despite available space and wildlife, precisely for the want of meat. Just how rewarding this could be is evident from an account by John Dalton of a typical Dyak expedition. He describes how, after careful planning, a distant settlement is surrounded under the cover of darkness, with all possible escape routes being carefully monitored. Just before daybreak the huts are set alight:

The hut roofs immediately and simultaneously burst into flames. Then the war-cry of the warriors is heard amid the crackle of blazing thatch and the collapsing hut-poles and walls. The work of the massacre begins at once, in the pandemonium that ensues. The male inhabitants of each hut are speared or hacked to pieces as they stumble down the ladders from their huts, many of which stand high on stilts, in a desperate attempt to escape the leaping flames. The flames give sufficient light for the warriors to distinguish between men and women.

The women and children – those who are not burned alive – escape to the jungle by the well-known tracks; but only to find these already guarded by sentries, from whom there is no escaping. They have no choice but to surrender, and are thus rounded up and placed under guards.³¹

That a small band of hunters can capture dozens of individuals within a short period of time illustrates the advantages of intra-specific predation. Conversely, those at the wrong end of the equation are not faced with the intermittent loss of one or perhaps two of their group, but entire communities may be decimated in one

fell swoop. Defence alone would not suffice under these conditions; retaliation and the elimination of the opposition would be necessary to secure a future. The rudiments of warfare, in other words, would need to come into play.

Among cannibal peoples, the motives for war generally involved the acquisition of human flesh (among certain tribes only the heads were important) or reprisals, which effected the same end. Not surprisingly, tit-for-tat confrontations were a regular feature.

The Methodist missionary, Rev. David Cargill, reporting from Fiji, relates the following:

February 2nd, 1840. Immediately after our English Class at the Mission we were called to witness one of the most horrid scenes that our eyes have yet beheld in this land. Eleven dead bodies were dragged to the front of the old king's house, but a few paces from our own door, from the adjoining island of Lauthala, having been slain together with the people of one whole village on the morning of the Sabbath by order of Tuilaila, the young king. The reason assigned was their having killed one of the Bau people living in this land.

The execution of the bloody massacre was committed to the people of a village situated nearer to the island of Lauthala than this. They fell upon them by break of day, while they were still asleep, and spared neither age nor sex. As far as we can learn, about 40 of them were slain, or near that number, and among the rest the principal chief of that isle. The bodies, being all brought into the presence of the two principal chiefs and their people, were quickly given out one by one, to be roasted and eaten, and were severally dragged away on the ground like logs of wood by their respective owners. After a while the chiefs and people dispersed to their disgusting feast. The offensiveness of the

bodies evidently diminished not their zest. Two bodies were dressed at a fire but a few paces from our fence.³²

The diarised accounts of Cargill leave us with a lucid impression of cannibal existence. Only a few months earlier, he was witness to the following:

October 31st, 1839, Thursday. This morning we witnessed a shocking spectacle. Twenty (20) dead bodies of men, women and children were brought to Rewa as a present from Tanoa. They were distributed among the people to be cooked and eaten. They were dragged about in the water and on the beach. The children amused themselves by sporting with and mutilating the body of a little girl. A crowd of men and women maltreated the body of a grey-haired old man and that of a young woman. Human entrails were floating down the river in front of the missionary premises. Mutilated limbs, heads and trunks of the bodies of human beings have been floating about, and scenes of disgust and horror have been presented to our view in every direction. How true it is that the dark places of the earth are full of the habitations of cruelty.

November 1st, Friday. This morning a little after break of day I was surprised to hear the voices of several persons who were talking very loudly near the front fence of the mission premises. On going out to ascertain the cause of the noise, I found a human head in our garden. This was the head of the old man whose body had been abused on the beach. The arm of the body had been broken by a bullet which passed through the bone near the shoulder, and the upper part of the skull had been knocked off with a club. The head had been thrown into our garden during the night, with the intention, no doubt, of annoying us and shocking our feelings.

These poor victims of war were brought from Verata, and were killed by the Bau people. 260 human beings were killed and brought away by the victors to be roasted and eaten. Many women and children were taken alive to be kept for slaves. About 30 living children were hoisted up to the mastheads as flags of triumph. The motion of the canoes while sailing soon killed the helpless creatures and silenced their piercing cries. Other children were taken, alive, to Bau that the boys there might learn the art of Feegeean (sic) warfare by firing arrows at them and beating them with clubs. For days they have been tearing and devouring like wolves and hyenas.³³

The trader, Daniel Henry Sheridan, witnessed the outcome of a conflict between two New Zealand tribes:

The principal part of the prisoners that day were cripples, women and children; the remainder making their escapes as well as their weak state would allow them (they had been besieged for a considerable time). A party of the enemy were employed in dispatching as many as would be sufficient for the evening's meal; their slaves getting the ovens ready, and the remainder went in search of more prey, which they found to the number of twelve hundred.

On the 23rd, they commenced the slaughter of the prisoners that were taken alive. They were crammed into huts, well guarded, the principal chief executioner, with a sharp tomahawk in his hand, ready to receive them. They were then called out one by one. Those that had well carved or tattooed heads had their heads cut off on a block, the body quartered and hung upon fences that were erected for the purpose. Those with indifferent heads received one blow, and were dragged to a hole to bleed. The young children, and grown-up lads, were cut down the

belly and then roasted on sticks before the fires.³⁴

What is underscored in these accounts is the number of surplus 'prey' involved. The average predator does not kill in overabundance. As Leyhausen's cat and mouse experiment indicated, the impulse to kill is outweighed by the 'tool activities' required for the kill. This does not seem to have been the case among cannibals, however. Edward Tregear, author of *The Maori Race*, mentions a chief personally killing "the greater number" of 250 prisoners which were brought before him to be bludgeoned to death ... the balance he apparently spared because he "was tired."³⁵

These figures become trivial when compared to the Aztec priests, who at certain ceremonies would tear the beating hearts from the breasts of literally thousands of victims. By some estimates, 300 000 individuals could end up this way in a single year. This figure becomes almost insignificant when considering the excesses of non-cannibalistic warfare (particularly modern warfare) where several millions may potentially lose their lives in a single year.

One of the peculiarities of intra-specific predation is that the number of prey consumed directly equates to the number of predators eliminated. The excesses involved can be accounted for from this perspective. But one is nonetheless bewildered by the senselessness of it all. A species hating its own kind, lusting after the flesh of its own kind, and killing its own kind well in overabundance ... how could it possibly survive?

TRIBALISM

An indiscriminate orgy of killing among members of the same species must inevitably lead to its self-destruction. And if the continued existence of cannibal man (which in the broader sense implicates Mankind) is

evidence that it didn't, then perhaps the killing was not as random as the term 'intra-specific predation' would suggest. Furthermore, if the killing was not random, then there must have been some form of distinction between the opposing sides.

For a species that has a sense for the abstract, a feather pierced through the nasal septum, distinctive scarring of the face, or simply applying mud or charcoal to the skin in a certain fashion would suffice to distinguish between friend and foe. The distinction between 'we' and 'they', and the implication that 'they' have no direct relevance to the perpetuation of the species other than presenting a threat, survives to this day, even among more developed cultures. Today, the group may variously be seen as the members of a country, a race, or those sharing a common language, but in Stone Age times, we can, with reasonable certainty, assume that the immediate group consisted of those displaying the relevant tribal markings. Among modern-day peoples less alienated from their roots, this is still the case and, judging by the universality of the phenomenon, is very deep-rooted indeed.

In effect, what the human species has realised with this adaptation is what the German ethologist Eibl-Eibesfeldt calls *pseudospeciation*.³⁶ Pseudospeciation suggests that tribal conflicts can be seen as taking place at the *inter-specific* level—i.e., between *different* species. And the fact that conscious boundaries exist between members and non-members, with rights and privileges denied to outsiders, certainly supports this view.

Tribal identity, or what sociologists refer to as 'ethnocentrism', tends to promote disdain for those who don't belong. We're familiar with the derogatory terms used to refer to specific ethnicities, but among certain primitive peoples, a distinction is made between the group and the rest of humanity. The Bushmen, for instance, call themselves '*!Kung*',³⁷ or human, implying

that the rest of humanity are outsiders. The Eskimos, or ‘eaters of raw meat’—a contemptuous name given to them by neighbouring Indians—see themselves as Inuit, ‘the real people’,³⁸ while the Gisu of Uganda simply refer to themselves as ‘*Basani*’, or men, and consider others as not worthy of the title.³⁹

Among certain cannibal peoples, the distinction is even more clearly defined. The Mundurucú head-hunters of the Amazon see outsiders as *pariwat*—considered dangerous but edible.⁴⁰ For the Azande of the Congo, the stranger was simply seen as available and legitimate meat⁴¹—a view few westerners understood as completely as Algot Lange who, in near-delirium, stumbled upon a village of Amazonian cannibals with whom he spent some time, even joining in the hunt and partaking of the ensuing cannibal meal. Among the formal acknowledgements in a book describing his travels, he includes one to the cannibal chief:

The generous high potentate of the tribe of Mangeroma cannibals is the second to whom I wish to express my extreme gratitude, although my obligations to him are of a slightly different character: in the first place, because he did not order me to be killed and served up, well or medium done, to suit his fancy (which he had a perfect right to do); and in the second place because he took a great deal of interest in my personal welfare, and bestowed all manner of strange favours upon me.⁴²

Captain Cook, the famed British naval officer and explorer, was not as fortunate and met his tragic end in Hawaii, served up most likely in accordance with local traditions. His vast travels and observations recorded in his *Journals* include an episode in New Zealand, which

sheds some light on the typical attitude of the cannibal towards his opponents:

One of the arguments they made use of to Tupia, who frequently expostulated with them against this custom, was that there could be no harm in killing and eating the man who would do the same by them if it was in his power. For, said they, 'Can there be any harm in eating our enemies, whom we have killed in battle? Would not those very enemies have done the same to us?' I have often seen them listen to Tupia with great attention, but I never found his arguments to have any weight with them. When Oedidee and several of our people showed their abhorrence of it, they only laughed at them.⁴³

The following war chant of the Tangales of Nigeria perhaps best sums up the sentiment between opposing cannibal (and non-cannibal) tribes:

Here is my enemy. He hates me, and I hate him. He kills me when he meets me. My god has now brought him under my feet. Let my enemy's people have their strength taken from them. Let their eyes become blind. When the warriors of my tribe go to enemies' territory, let all the enemies quickly die at their hands. If any of this enemy's spirit survives, may he come back to possess his own father and his own mother and all the members of his family!⁴⁴

TABOO

The tribal impulse (as author Robert Brain defined it), while on the one hand determining the attitude towards non-members, would naturally include a set of standards that applied to fellow members. And while

pseudospeciation may denigrate the opposition as 'dangerous prey' (from a cannibal perspective), in real terms, members and non-members are alike—morphologically and, undoubtedly, culinarily. The development of safeguards against the killing and eating of pseudo *conspecifics* (fellow tribe members in this case) would, in other words, have been imperative.

In this regard, cannibal man had a typically practical approach. The French surgeon, Dr Felix Maynard, assigned to a whaling fleet in the South Pacific of the nineteenth century, relates the following:

The code of the Battas of Sumatra condemns to be eaten alive those guilty of adultery, those who commit theft at night, prisoners of war, those who treacherously attack the inhabitants of a house, or a lonely man. The execution takes place without delay, in the presence of the whole population. In cases of adultery, one last formality is necessary: the relatives of the criminals must be present at the carrying out of the sentence. The husband, the wife, or the persons most directly offended, have the right to retain the ears of the condemned for themselves. Then, each according to his rank chooses his fragment, and the chief judge cuts off the head and hangs it like a trophy at the door of his hut.⁴⁵

As harsh as it may appear to our own sensibilities, the basic universal tenets of 'thou shalt not kill; thou shalt not steal; thou shalt not commit adultery;' etc. (which have as an objective the minimising of aggression within the group), are here simply interpreted from a cannibal perspective. Yet, what one would expect to be the most rigorous of controls—the prohibition against the *consumption* of fellow tribe members—is here wholly ignored. This is perplexing, considering that consuming offenders was customary among canni-

bals. Indeed, a man might eat his own wife if she were found guilty of some breach of tribal law.⁴⁶

The following comments by Garry Hogg regarding similar customs among Nigerian tribes do, however, seem to suggest a behavioural distinction:

Certain of these tribes had evolved a fairly elaborate penal code in connection with their cannibal practices. For example, the Hill Angas would eat the flesh of a member of their own tribe, if he had been convicted as a criminal and so sentenced to death. The Sura would eat the flesh of a woman of their own tribe whose crime was that of adultery. The Warjawa were prepared to sacrifice any member of their own tribe who had violated tribal law, and it is evident that such punishment was accompanied by a fairly elaborate ritual. The victim was not so much killed as sacrificed; his blood was poured out as an oblation; only after this ceremonial was his flesh made available for the other members of his or her tribe to feast on.⁴⁷

For Stone Age cannibals faced with hunger and accustomed to the eating of human flesh, it would have made perfectly good sense not to let the available protein go to waste, and in order to come to terms with this bizarre situation, it would seem from the above that ritual and ceremony were employed as somehow absolving the aggrieved of any wrongdoing. The supernatural was invoked, in other words, and to this day the affairs of many a tribal people are regulated by the forces of the unknown. Indeed, taboo has become so deeply ingrained in the consciences of certain ethnic groups that it may even override the instinctive impulses that nature herself has provided.

This cannot be more clearly demonstrated than by the following incident involving two Ute tribesmen. Konrad Lorenz cites the work of Sydney Margolin:

Violence towards people not of their tribe, and even manslaughter, belong to the order of the day, but attacks on members of the tribe are extremely rare, for they are prevented by a taboo the severity of which is easy to understand, considering the early history of the Ute's: a tribe constantly at war with neighbouring Indians and, later on, with the white man, must avoid at all costs fights between its own members. Anyone killing a member of the tribe is compelled by strict tradition to commit suicide. This commandment was obeyed even by an Ute policeman who had shot a member of his tribe in self-defence while trying to arrest him. The offender, while under the influence of drink, had stabbed his father in the femoral artery, causing him to bleed to death. When the policeman was ordered by his sergeant to arrest the man for manslaughter – it was obviously not murder – he protested, saying that the man would want to die since he was bound by tradition to commit suicide and would do so by resisting arrest and forcing the policeman to shoot him. He, the policeman, would then have to commit suicide himself. The more than short-sighted sergeant stuck to his order and the tragedy took place exactly as predicted.⁴⁸

Cannibal taboos, for obvious reasons, laid emphasis on the 'dos' and 'don'ts' of eating human flesh, and different interpretations of this existed. The Ganawuri of Nigeria, for instance, forbade the eating of the flesh of women and children, while the neighbouring Abadjas placed a restriction on the flesh of women only.⁴⁹ In New Caledonia, it was considered taboo to eat the *torso* of a woman, while the arms and legs were permitted.⁵⁰

Other traditions restricted the slayer from eating the flesh of those he had himself killed, while being free to

feast on the victims of his comrades. For the Orokaiva of Papua, this taboo applied not only to the slayer but to his nearest relatives as well:

If they were rash enough to partake, their genitalia would swell, their joints grow crooked and their heads turn bald. In view of such alarming risks, it seems likely that there was thought to be in the person of the slain something like infection to that of the slayer. The slayer would always be prompt to remove his perineal band and wear a leaf, or nothing at all, until he reached home and could affect a change of clothing. If he had despatched his victim with a club, he would straightway change this for another man's; on no account must he shoulder the club that struck the mortal blow, for he would then run the risk of a swollen or distorted shoulder-joint.⁵¹

Just how entangled in the abstract such regulations became is illustrated by the following account of J. H. P. Murray, Chief Judicial Officer in Papua, who has been referred to earlier:

The people of the Purari Delta are naturally secretive as to their religious beliefs and practices, and not inclined to discuss them with strangers, but information emerges in the course of trials and official investigations. For instance, in the year 1909 I tried a man called Avai, a native of Baimuru, who was charged with the murder of a woman of Baroi. His statement contained some curious details. He said: 'Bai-i told us to kill three Baroi people. We caught Aimari and his two wives, in Era Bay. Kairi killed Aimari. I killed one wife, and Iomu the other. I killed the woman with a dagger of cassowary bone. We put the bodies in the canoe and took them back with us. I did not bite off

the woman's nose. It is not our custom to bite off the nose of a person you have killed. If I kill a man or a woman, someone else bites off his nose. We bite off the noses of people that others have killed. We bite them off; we do not cut them off.

We left the three bodies in our canoe till morning. Then we took them into our village and put them on the platform. Then we singed them, cut them up into small pieces, mixed the pieces with sago, cooked them, wrapped them up in leaves of nipa-palm, and distributed them. I ate a hand of one woman, but it was not the hand of the woman I myself killed. It is not our custom to eat a person we ourselves killed. But if, after killing a man, you go and sit on a coconut, with also a coconut under each heel, and get your daughter to boil the man's heart, then you may drink the water in which the heart has been boiled. And you may eat a little of the heart also, but you must be sitting on the coconuts all the time'.⁵²

Sitting on a coconut while feasting on the heart of your enemy, as ludicrous as it may seem, is indicative of the central role that the abstract has played in the affairs of Man, and this regulatory role has extended well beyond the issues concerning the consumption of human flesh.

INITIATION

Of particular interest is the widespread practice of initiating adolescent males into manhood. On the surface, this may seem a mere cultural peculiarity designed variously to harden the initiate and qualify him for the right to sire offspring, sit in council, carry weapons, etc., but the implications run far deeper than this. For the majority of tribal peoples, it is at this time

that the young male receives his tribal markings. Not only does he thereby lose his status as a child (which generally confers a measure of protection), but he now officially joins the ranks of the fighting element of human society, which implies a completely new set of standards.

Only the adult males are killers—unlike the carnivores where both genders hunt and kill—and the fate of the tribe lies in their ability to deal with life-threatening situations. By implication, their effectiveness at accomplishing this is paramount, and they have consequently developed into a cohesive warrior class that enjoys privileges denied to others. It comes as no surprise, therefore, that women in several cultures were barred from eating human flesh (the spoils of combat), as were children and older men in others.

Cannibal customs varied widely in this regard, however. Warriors of the Nigerian Ganawuri and Rukuba people would hand over the spoils to the fathers of their tribes to indulge in,⁵³ while the Wagawaga of New Guinea denied the aged even a morsel.⁵⁴ Among the Nigerian Yergum again, the body might be consumed by any member of the tribe, but no one was permitted to “eat flesh from the head unless he himself had actually killed an enemy in battle or foray.”⁵⁵

Making a distinction between those who play a direct part in the demise of the enemy (eating flesh from the head) and those who don’t favour competition in the killing process, and so where able-bodied fighters—the element crucial to survival—are recognised for their prowess, the continued existence of the tribe also becomes more favourable.

The anthropologist P. A. Talbot, writing of Nigerian cannibals in the early part of the twentieth century, gives us a typical insight into these trends:

Directly an enemy is slain, his head – and sometimes his body, if the people were strongly

cannibalistic – was taken to the village and a great dance given, either at once, or after the skull had been cleaned of its flesh by boiling, or by being buried for a time in the ground. At the feast, every man-slayer of the village danced round, generally with a skull in one hand and his machete in the other. Sometimes the body of the enemy was brought in whole; sometimes it was cut in pieces in advance to facilitate transport. It was then boiled in native pots and shared out, occasionally among the man-slayer's family and friends, but sometimes among all the people of the village, until it was wholly consumed. In some tribes it was forbidden for women and children to partake of human flesh; in others, for example among the Kalabari, the eldest sister of the hut was forced to taste it, however strongly she might protest. Among the Abadja, the whole body of anyone slain was ordinarily taken back to the village and there consumed, though it was tabu (sic) to eat women or children. A man only divided his 'kill' among his own family. The body was cut up and cooked in pots; the fingers, palms of the hands, and toes were considered the best eating. Sometimes, if a family had been satisfied, part of the body would be dried and put away for later.⁵⁶

Clearly the 'man-slayers' here enjoyed a privileged status. Besides the skull-wielding dance reserved exclusively for the killers, the division of the 'kill' also remained the prerogative of the slayer. And this was by no means an isolated phenomenon. The Aztecs, worlds apart culturally and geographically, differed little in this respect:

Bereft of its heart, and much of its blood, the body [of the sacrificial victim] was of no further service to the High Priest. It was therefore

thrown down the great flight of stone steps that characterised the Aztec temples, from the altar at the summit to the people waiting in the courtyard below. There it was seized by other priests and given to the warriors responsible for the original capture of the victim. The skin was carefully removed, and donned by the chief of the warriors concerned, who believed that by wearing it he would gain something of the dead man's fertility and soul-stuff. The body was then cut up and eaten by the warriors and their closest associates.⁵⁷

The chief warrior may well have believed he was gaining virtue from the dead man, but in essence he was (along with his underlings) being recognised for his prowess as a killer, however grotesque the honour that was bestowed. Similarly, the Nkanus of Nigeria honoured the warrior who returned with a human head by presenting him with gifts and celebrating the occasion with "much palm-wine."⁵⁸ For the Dyaks of Indonesia again, honour was displayed by the exclusive right of the man-slayer to ornament the "head-carrying-basket" that he wore at his hips with locks of human hair.⁵⁹

This unique status of the man-slayer in a broader sense reflected the status of the warrior class as a whole, where exclusive rights and regulations ensured their pre-eminence over the rest of the tribe. Women the world over, for instance (cannibal and non-cannibal alike) were once, and still are, denied knowledge of certain male activities. An Australian aboriginal woman could be killed on the spot if caught eavesdropping on the private rituals of men.⁶⁰ A Tsonga woman of southern Africa who "laid her eyes" on the leaf-dressing with which the circumcised cover their wounds, *had* to be killed.⁶¹ Among the Kukukukus of New Guinea again, merely *hearing* the "killing chant" of the *tumbu-lun* (a

pipe instrument that is swung over the head), could cause a woman to die at the hand of “evil spirits.”⁶²

The severity of these penalties indicates that there must be more at stake than the ego of the warriors. The fact that the *life* of a fellow female tribe member may be taken suggests that her knowledge of the goings-on would somehow impact the warrior fraternity negatively. Whatever the males are up to in secret, in other words, is done with the knowledge that their women-folk would strongly object.

In the cannibal context, we can surmise that the consumption of human flesh in certain cases may have become an exclusively male custom and that, with mounting hostility from non-participants (females), the practice continued covertly. Tongan women, for instance, would avidly avoid those tribesmen known to have indulged in cannibalism, calling out to them, ‘*ia-we moeky-tangata!*’, or ‘Keep off! You eaters of human flesh’.⁶³ A more substantial explanation, however—one perhaps best understood by those who are newly recruited into the adult male fraternity—is that the average mother who perchance should witness what her sibling is being subjected to during initiation would feel compelled to interfere on his behalf. Not many mothers, after all, would go along with the ritualised introduction boys receive into adult male life.

In order to be ‘born’ as a man, the boy must undergo a ritual death—the bonds with the mother must be broken; at least, these are the recurring themes of initiation rites across the globe. This may seem coherent enough, but the implication is that manhood entails being introduced to death ... that manhood, in essence, is associated with the process of killing and bloodletting. Of interest in this regard is that cannibal and non-cannibal peoples seem to share similar customs.

One Melanesian practice involves a progressive series of nose bleedings caused by slivers of bamboo

twirled in the nostrils.⁶⁴ Kukukuku boys again are beaten with thorny sticks “until the blood runs down their bodies.”⁶⁵ The Australian aborigines, according to anthropologist A. P. Elkin, practised the following:

In nearly all tribes from the west to the east and from the north to the south, at some part of the initiation series a blood rite is performed. It consists of anointing the newly initiated with arm-blood from the older men, or else giving them some of this to drink. The older men also anoint themselves, or each other, and drink blood.⁶⁶

The semblance to cannibalism in many initiation rites cannot be ignored. Many boys, for instance, are ritually bled, shaved, and washed—the same procedure that cannibals once followed when preparing human flesh. In eastern Africa, the Pokot people cover the scalp of the initiate with clay,⁶⁷ which is how the Jarawa cannibals of Nigeria once cooked the heads of their victims.⁶⁸ Similarly, the practice of smearing the entire body of the initiate with clay is almost universal among indigenous peoples of central and southern Africa. The Tsonga people call this custom ‘eating sheep’s fat’. The ritual of beating with sticks to draw blood from the initiate they call ‘drinking goat’s milk’, and, significantly, binding the circumcised penis with green leaves (as is custom) is called ‘eating sheep’s flesh’.⁶⁹

Whether ‘goat’ and ‘sheep’ are the actual words used—given the secrecy of these rituals—remains to be seen. It is nonetheless intriguing that the initiation process (symbolical death) among these non-cannibal people should allude to fat (clay), blood (goat’s milk), and the eating of flesh. The eating of flesh, furthermore, is associated with circumcision, which involves a piece of flesh *literally* being cut from the body of the initiate. Another peculiarity is found among the Pedi who, like

the Tsonga, have no known history of cannibalism. Here, the boy unfortunate enough to die during initiation (which is not uncommon) is referred to as having been *eaten*.⁷⁰

Among cultures the world over, killing a human was once the prerequisite for attaining manhood. A Spartan youth, in order to be recognised as a man in the community, was expected to kill a *helot*, or slave, single-handedly.⁷¹ Shaka's warriors were similarly recognised as men and permitted to wear a distinctive headband only once they had killed in battle.⁷² The Scythians, Herodotus noted, had to drink the blood of their first victims⁷³—a practice, cannibals would tell us, that imbues the novice with strength and courage.

Among cannibal peoples, the consumption of human flesh was a prerequisite for attaining manhood. Those who hadn't consumed human flesh were considered less than men and not worthy of the status. Like blood, human flesh was perceived as possessing some measure of power, and only through the act of cannibalism could the virtues of manhood be acquired.

The general sentiment in this regard is illustrated in a report by the missionary George Basden, writing from Nigeria in the early half of the twentieth century:

On one occasion I was resting outside my hut when a man of unprepossessing appearance came along and entered into conversation. His eldest son, then a small lad, had been placed by his father in the care of a missionary, in order that he might receive instruction. In the course of his remarks, he solemnly asserted that it would be of great benefit to his son if he were provided with human flesh sometimes as part of his diet. He maintained that if this were done a proper man's spirit would develop in the lad.⁷⁴

To what extent these sentiments may survive in present day initiation rites would be hard to determine given the clandestine nature of the subject, although an interview with an Aborigine chief of Yam Island did reveal that he had eaten finely-chopped human flesh mixed with crocodile meat at his initiation, the purpose of which was “*to make heart come strong inside.*”⁷⁵ Certain African boys are also given strengthening medicine during initiation, which among the southern Sotho and the Transvaal Ndebele is known to contain human remains.⁷⁶ The Zulus include in a similar medicine human fat, making a clear distinction between European (*ephumalimi*) and native (*isothamlilo* or *igumbandlela*) fat.⁷⁷

The practices of the Purari Delta people of Papua New Guinea, which they only recently abolished (post-WWII), provide a clear perspective on the subject:

The Purari tribes all shared an elaborate religious belief system in which all adult males participated. To become a participant, boys had to go through an initiation ceremony (*pairuma*) in which they ate part of a dead enemy. By so doing, they acquired the power (*imunu*) of the victim. Only males were cannibals and it was only done in connection with this initiation ceremony. However, victims could be male, female, young and old. Without acquiring *imunu*, boys could not become men, get married, or assume political and religious offices. They would remain children all their lives.⁷⁸

HEAD HUNTING

The pursuit of power—the perceived transference of certain values from the dead to the living—characterised the cannibal mind. The heart of a courageous man, the legs of a fast runner, the blood of a chief—these were coveted by those involved. Dr Felix Maynard,

previously mentioned, elaborates on the practices of the Melanesians:

When the victor eats his foe after the combat, he believes he eats not only his body but also his soul. It is an outrage to eat the body; and it is an advantage to eat the *waidoua*— the soul of the vanquished — because this is then assimilated with one's own. This superstition is all-powerful in wartime. Usually, after a fight they commence by devouring the bodies of the oldest and most courageous warriors, those most completely tattooed, leaving the corpses of the younger men aside, those that were novices in warfare, even though their flesh might be more appetising. Thus, before all, the victors value the assimilation, the appropriation, of the life and courage of the most celebrated warriors, however thin and fleshless they may be.⁷⁹

The advantage of singling out the ablest of your enemies, any good strategist will confirm, is invaluable. Wars have been concluded and averted with the death or arrest of key individuals. That the superstitious desire to eat the heart of the opposing side's most courageous fighters brings into effect this same principle (albeit perhaps not at a conscious level) again emphasises how the abstract has been at work in the development of Man.

Florence E. Coombe, secretary of the Bishop at the Melanesian Mission *circa* 1905 relates how, when a powerful chieftain is slain in battle, "... the yearning of all the men who were his enemies to obtain a portion of his spirit—that *mana* which is the secret of his valour and success—develops into an almost religious ceremony. A mere mouthful of the brave man's flesh is thought to convey his coveted power."⁸⁰

The typified Aztec sacrifice, where the hearts of human victims were offered to the sun in order to delay

the end of the world, is principally of the same fabric. The objective was to convey to the sun the perceived 'supreme medium' of strength and courage—the heart—thereby ensuring its longevity. Indeed, for as long as the hearts of the enemy were being offered, the Aztecs were indirectly ensuring their own continued existence under the sun.

Edward Treager, author of *The Maori Race*, tells of another aspect emanating from the same superstitious regard for the human heart:

Sometimes the heart of the vanquished was roasted for ceremonial purposes. When the Kaiapoi stronghold was attacked by the forces of Rauparaha, the heart of a chief of the defending party was cut out and roasted in a fire, while all the attacking warriors stood round it in a ring. The priests chanted and the warriors stretched out their arms towards the heart while it was cooking. When the priests ended their chant, the warriors took up the song, while the chief tore off a portion of the heart and threw it among the enemy to weaken them.⁸¹

To what extent practices such as these may influence the psyche of those involved is open to debate, but few will deny that there has to be some effect, however marginal. Surely the warrior who believes he has gained courage by performing a solemn ritual has more bravado when next on the battlefield, however short-lived that might be? Where things do become problematic is when the *tangible* aspects of the 'transfer of virtue' are considered. To be instilled with courage by the heart of your enemy or conversely robbed of courage by the grilled heart of your chieftain is one thing; to believe that one's running pace can be increased by consuming the leg muscles of an accomplished sprinter is something entirely different.

Yet there may be more merit to the idea than we care to consider. Most of us, after all, will confirm that anger can produce a tightness in the chest or lungs, and powerful emotions somehow make themselves manifest in the area of the heart—the seat of a man's courage, according to cannibals. Fear, again, centres on the intestines, which among cannibals was perceived as emanating from the liver. Similarly, the gall, kidneys, spleen, etc., are said to convey certain characteristics, as do the sex organs and the brain—the centres, no one will dispute, of lust and intelligence respectively.

This brings us to the one virtue that prehistoric Man may have coveted with equal, if not greater, zeal than courage itself: the intelligence of a worthy opponent. To what extent could the universal practice of cannibalising the human brain—a practice that seems to have continued well beyond the cannibalising of the human body—have had an influence on our cerebral development?

Among cannibals, the association of intelligence with the consumption of brain matter is perhaps evident in the fact that the head was generally, although not exclusively, the prize of the leaders of the clan—the thinkers. And there certainly does not seem to have been a shortage of this commodity. The explorer John Dalton, for instance, relates how a Dyak chief he knew received more than a third of *seven hundred* human heads that his warriors brought back from an expedition.⁸²

Head-hunting not only signified the demise of the enemy but also the capture of his spirit, or soul, which was believed to reside in the brain. For many a tribe, this became their sole pursuit, suggesting a protracted form of cannibalism—a custom practiced by those no longer dependant on human flesh but nonetheless still caught up in the bloody rivalry of intra-specific predation. Anne Ross in *Everyday Life of the Pagan*

Celts provides us with an interesting perspective in this regard:

The Celts, like many other barbarian peoples, hunted human heads. We know this from the skulls found in Celtic hill-forts; in some cases, the nails from which they were suspended on the gateway or on posts round the ramparts were still present. These severed heads would serve as trophies testifying to the military prowess of their owners; and, at the same time, the powers, believed to be inherent in the human head, would act protectively and keep evil from the fortress or the home, while ensuring positive good luck and success. Diodorus Siculus comments on the custom of decapitating their enemies amongst the Gauls, and describes how they nailed them up on their houses or embalmed them in oil and regarded them as priceless treasures. His testimony as to the importance of the head in Celtic everyday and spiritual life is supported by an observation by Livy: 'The consuls got no report of the disaster till some Gallic horsemen came in sight, with heads hanging at their horses' breasts, or fixed on their lances, and singing their customary song of triumphs.'

Livy likewise describes the placing in a temple of the head of a prized enemy chieftain by the tribe, the Boii, in 216 BC. Human skulls were displayed in skull-niches at the great temples at Roquepertuse and Entremont, further testifying to the correct observations of the Classics. Livy, moreover, remarks upon the Celtic custom of decorating human heads with gold and using them as drinking cups, and this may have been the function of the human skull found in the sanctuary at Libenice. There are many instances of heads being used in these ways in the vernacular literatures. Straightforward head-hunting occurs regularly in the Ulster Cycle of

Irish stories as well as elsewhere. In the Tain, after his first skirmish since his taking of arms, Cu Chulainn returns to Emain Macha with a flock of swans, wild deer, and three severed heads. Later in the Tain, he is described as having 'nine heads in one hand and ten in the other, and these he brandished at the hosts in token of his valour and prowess.'⁸³

Although there is no record of the Celts actually eating the contents of their captured heads, Ross does make the interesting observation that "several heroic or divine characters are referred to as never sitting down at a feast without having a severed head before them on the table."⁸⁴

It would seem that among the Celts, the *symbolic* value of the head had outlived its gastronomic worth. The inherent 'powers' of the human head were manifest in their open display, which conveyed the impression of a formidable adversary, in this way acting protectively to 'keep evil from the fortress or home'.

SACRIFICE

The importance of the human head in the lives of those who adhered to the custom would understandably have led to head-hunting being associated with certain aspects of fertility, considering that its procurement is directly related to the demise of hostile elements. Sir Hugh Low, Police Magistrate for Labuan in southeast Asia from 1850 to 1877, summarises the beliefs of the Dyaks in this regard:

Feasts are held with specific objects in view: to make the rice crop flourish, to cause the forests to abound with wild animals, to enable their dogs and snares to be successful in securing game, to have the streams and rivers swarm with fish, to give health and activity to the

people themselves, and to ensure fertility among their women. All these blessings are, it is believed, most efficiently and certainly secured for the tribe by the capture of a victim and the feasting upon his head.⁸⁵

It goes without saying that the severed head of the enemy represents the elimination of opposition, which in turn would mean more available wildlife, more fish in the streams, an increase in population, etc. Insofar as making the rice crop flourish, E. O. James, an anthropologist in the field of comparative religion, points out a subtler belief associated with the practice:

In Borneo the head is believed to contain the ghost, or *toh*, which, so long as it is not neglected, produces fertility in the soil, promotes the growth of the crops, and brings prosperity to the community in general and to the person who captures the head in particular. The soul is conceived as a sort of egg, or bladder, filled with a vaporous substance which is spread over the fields as a magical manure when the bladder bursts. The grain is fertilised, since the vapour holds the vitalising principle. And when the grain is eaten as food, its life-giving power is communicated to the blood, and thence imparted to the seminal fluid, by means of which men and animals are enabled to propagate life.

There is, then, an intimate connection between the soul and fertilisation, and head-hunting is largely prompted by the idea of securing additional soul-substance to increase the productivity of the soil and, indirectly, the fertility of the tribesmen and tribes-women. It adds to the vital essence in the village: hence it is essential that as many heads as possible shall be acquired.⁸⁶

The rhetoric may be different, but the association of fertility with the demise of the enemy remains a central feature, however creative the cultural approach may be. There is an added dimension to these beliefs, however, a tangible aspect of death and fertility that bears consideration. A Kukukuku legend illustrates this well:

A long time ago some people killed a man and cut him in pieces. They cut off his fingers, his legs, his arms, and smashed his head. They spread all the pieces over a new garden; then they made a bonfire. The fire flared up. Then they went to their huts and stayed there. After some time they looked at the field. There were now bananas, taro, yams, sugar beet, and kaukau. They took these and went around to all the fields and planted them. There was enough for all the gardens. Since then we have planted all these things.⁸⁷

E. O. James refers to a case among the Bechuans where “a short stout man was slain in the midst of the wheat to serve as ‘seed’. After his blood had coagulated in the sun, it was burned along with the frontal bone and the brain; the ashes were then scattered over the ground to fertilise it.”⁸⁸ Another case, in west Africa, involved the killing of a man and woman with spades and hoes “in order that their bodies might be buried in the newly-tilled field.”⁸⁹

It would seem from the above that the association of bloodshed with fertility somehow found expression in the yield of the soil. Whether, as the Kukukuku legend suggests, this happened by chance is anyone’s guess, but cultivation arguably, at some stage, became associated with the aspects of fertility that had evolved under more brutal conditions.

The Aztecs provide us with invaluable insights in this regard. Garry Hogg comments on the ceremonies associated with cultivation, as follows:

In February, for example, young children were immolated to the gods of rain and water in order that the new year's crops might not wither from drought. At another festival, the blood of children who had been thus sacrificed was collected by the priest and kneaded into an image of the god, Uitzilopochtli, made of maize dough. The heart of the image was ceremoniously cut out by the priest and given to the reigning Aztec king to consume, while the remainder of the image was distributed among the notables, a small portion to each.

Totec, the Moon-god, had to be propitiated in the period immediately preceding the first sowing of seed, and this entailed human sacrifice. This time it was not children who were involved, but a prisoner of war – and the more courageous he had proved himself in battle the better the prospects for the new crop. The ritual here was to fasten the prisoner to a frame of timber, with arms and legs spread-eagled. Arrows were then shot into him, so that he bled profusely, and his blood sacramentally fertilised the soil.

There were interesting and elaborate variants on this fundamental religio-magical practice. Sometimes, when the victim had bled profusely but was yet alive, he was removed from his wooden framework and sacrificed in the customary way, his heart being cut from his living breast by a priest using an obsidian knife. His skin would then be flayed from his body, and donned by the priest representing the Earth-Mother, symbolising the donning of a new mantle – that of a new and full-eared maize crop. In order to emphasise the symbolism, the priests assumed disguises resembling maize ears and maize stalks, and indulged in an elaborate ritual dance before the altars and within sight of the fields which had been

recently sown. Meanwhile, the flesh of the victim, or of the victims where more than one had been sacrificed to the gods and goddesses, was distributed among the warriors who had been responsible for procuring the prisoners of war for the purpose of the ceremony.⁹⁰

Of particular interest is how fertility, in the second instance, is associated with the blood of the *courageous* enemy and, furthermore, that the bloodletting involves his *suffering*.

A case of human sacrifice among the Pawnee Indians in 1838 has close parallels, except that the sacrificial victim in this case is taken from within their own ranks, as is again described by Hogg:

A girl in her earliest teens was selected for sacrifice. For a period – not of months, as with the Aztecs, but of days – she was conducted through the village, from wigwam to wigwam, in a procession headed by the chiefs and warriors. At each stopping place she received a gift. When the last one had been reached, she was painted red and black – a echo of the Aztec painting to represent the maize crop – and then placed over an open fire and slowly roasted to death, while the tribesmen shot arrows at her body to spill the blood.

At the appointed moment the chief sacrificer tore out her heart and ate it. The remainder of her body was then ceremonially cut up into small portions, which were placed in baskets and taken out to the maize fields. The next stage in the ceremonial was to take the pieces of flesh, one at a time, from the baskets and carefully squeeze the drops of the warm blood on the newly planted grain. By this process, they believed, the seeds would be vitalised. The fragments of flesh, squeezed almost dry of blood, were then made into a sort of paste

which was carefully rubbed over root vegetables such as potatoes to bring them safely to maturity.⁹¹

That the pleas of the murderous enemy should be confused with the pitiful cries of a loved-one slowly roasting to death boggles the mind, but one can nonetheless conceive that this would have had tremendous psychological impact, more so than the suffering of the enemy, and on this basis, the practice may have been perceived as having greater influence on the yield of the soil.

Here, the element of atonement also comes to the fore (which is a central feature of sacrifice) in the ritual offering of gifts to the hapless victim. An underlying sense of guilt and a need for absolution is also evident in the measure of honour bestowed upon such victims, as if somehow having been elevated to a higher social ranking. Indeed, with this approach, the 'chosen one' essentially becomes alienated from his/her fellows and, conceivably, no longer qualifies as being *quite* one of their 'own'.

The Khonds of Bengal used to regularly sacrifice a young man as a guarantee for good crops. Typically, he was chosen from a pious family and treated with the 'utmost reverence' until he was strapped to a wooden effigy of the 'earth goddess' and then carved up piece-meal while still alive. Portions of his flesh were then ceremoniously wrapped in green leaves and buried in the most important fields.⁹²

The chosen victim for the Aztec feast of Toxcatl was housed in the temple itself and 'groomed' for the part he was to play a *year* later:

... he was regarded as something between a king and a god; he was waited upon hand and foot by notables of the community, under the constant supervision of the temple priests. On

the rare occasions when he was permitted to descend the stone steps of the temple and walk in the streets below, the people made holiday and he was regarded with awe, as a visitor, almost, from another planet.⁹³

At the appointed time, he was slaughtered in the customary manner and his successor announced.

Across the globe, myths, legends, and archaeological finds attest to the fact that sacrificial victims were somehow ‘revered’ and immolated with all the fineries of their particular culture. The victim (‘something between a king and a god’) personified the rite, became the visible aspect of the supernatural. Is it any wonder then that the powers of the unseen came to be associated with anthropomorphic demigods?

We can envisage that, just as superstition likely has its roots in survival-based taboos, so the complex sacrificial observances of old developed from pre-historic bloodletting rites associated with fertility. Sacrifice can, within this context, be seen as not merely as an element of religion but the precursor thereof—the source of the conceptualisation of the omnipotent.

A Vedic proverb says, “The sacrificer hunts Indra like game, and holds him fast as the fowler does the bird; the god is a wheel which the singer understands how to turn,” to which the Catholic Encyclopaedia comments, “The gods derive their whole might and power from the sacrifice as the condition of their existence.”⁹⁴

SLAVERY

The extolment of the victim was not exclusively the case, of course, albeit as a rule affiliated with the more important ceremonies. A victim could be slain in order to predict future events from his dying convulsions, be tossed into a bog for having harvested the last corn

sheaf, be interred at the cornerstone of a new structure, or simply be buried alive—as did the Roman senate a Greek and Gallic couple in 228 BC “in accord with the dictates of a Sibylline oracle.”⁹⁵

The observations of the traveller Alfred St Johnson, while among the Fiji Islanders towards the end of the nineteenth century, illustrates to what extent the practice could digress:

No important business could be commenced without the slaying of one or two human beings as a fitting inauguration. Was a canoe to be built, then a man must be slain for the laying of its keel; if the man for whom the canoe was being built was a very great chief, then a fresh man was killed for every new timber that was added. More men were used at its launching – as rollers to aid its passage to the sea. Others again were slain to wash its deck in blood and to furnish the feast of human flesh considered so desirable on such occasions. After the canoe was afloat still more victims were required at the first taking down of the mast.⁹⁶

The consumption of human flesh was clearly a motivating factor in the excerpt above, which deviates from the more conventional issues of sacrifice, but it nonetheless raises the question of the status of the victims. Had the victims all been compatriots, one would not expect there to have been much enthusiasm in the boat-building process, to say the least.

It was typically the enemy who could be dispensed with in any manner desired. Fellow tribe members were reserved for the more austere ceremonies, as we have seen. There was, however, an added dimension to the social lives of cannibals which would explain the nonchalance with which the above victims were treated—the taking of slaves. With neither right nor title and subject to every whim and fancy of their

masters, slaves made the ideal proxies for the mundane sacrifices, where bloodletting and atonement didn't feature.

The taking of slaves has been a feature throughout human history, among peoples as disparate as hunter-gatherers, nomadic pastoralists, and seafarers—even advanced civilisations. And while the usefulness of slaves may have varied culturally, they almost always constituted an ethnic group different to that of their masters. They were, in effect, as the Sumerian cuneiform symbol for slave suggests, 'foreign'⁹⁷—non-members deprived of social rights. Indeed, their very lives were in the hands of their masters.

Slaves, invariably, were considered the spoils of war. There are cases, of course, where people were sold into slavery in lieu of some form of debt incurred, but as a right of conquest, Egyptians enslaved Hittites, Greeks enslaved Egyptians, Romans enslaved Greeks, etc. According to Plutarch, in the year 167 BC, 150 000 slaves were sold in a single day from a single market.⁹⁸

We generally envisage slaves labouring in mines, constructing buildings, hammering away at granite, etc., with the more fortunate ones tilling the fields and serving in the kitchens. Yet, as difficult as their conditions may have been, it was the healthier alternative to being slaughtered in the throes of battle ... much more fortunate, indeed, to being seized by a band of Stone-Age cannibals that had no use for slaves.

Or did they?

The origins of slavery seem to go well beyond the requirements of labour, beyond the acquisition (as among the Aztecs) of a constant supply of sacrificial victims. Slavery is in fact a feature of the basest of cannibal practices, which suggests that it has been with us for a considerable time.

H. Wilfred Walker, who had travelled widely in the South Pacific and joined a punitive expedition against

the Dobodura, tells us of a peculiar aspect of their cannibal practices:

The Papuans do not as a rule torture their prisoners for the mere idea of torture, though they have often been known to roast a man alive – for the reason that his meat is supposed to taste better thus. I have heard of cases of white men having been roasted alive, one case being that of the two miners, Campion and King. But we had learned that this Dobodura tribe had a system of torture that was brutal beyond words. In the first place they always try to wound slightly, and capture a man alive, so that they can have fresh meat for many days. They keep their prisoners tied up alive in the huts, and cut out pieces of their flesh just when they want them; we were told that, incredible as it may seem, they sometimes manage to keep them alive for a week or more, and have some preparation which prevents them from bleeding to death.⁹⁹

This excerpt may not reflect slavery per se, but it does illustrate a significant shift from the wholesale slaughter of the vanquished to a motive for keeping the victim alive.

The Dobodura weren't alone in this practice. Some of the Solomon Islanders, according to A. I. Hopkins, who spent a quarter of a century in the region, would keep their victims alive "to be killed and cooked when a festive occasion occurred."¹⁰⁰ Likewise, in New Zealand, Edgar Traeger tells of "captives penned up like live-stock waiting to be killed and eaten."¹⁰¹ The Battas of Indonesia, again, purportedly reserved their captives for times of peace, immolating "sixty to a hundred slaves annually."¹⁰²

The interpretation of the word 'slave' among cannibals quite clearly differed from the conventional

understanding. Slaves were considered little more than livestock, and accounts of their nonchalant butchering for the pot are widespread. The Rev. W. Holman Bently, who spent twenty years in the Congo of the late nineteenth and early twentieth centuries, mentions in *Pioneering on the Congo* how the tribes along the Mobangi River kept and fattened slaves for butchery ‘as we do cattle and poultry’. Raids were organised specifically for the acquisition of slaves:

They divided up their human booty and kept them, tied up and starving, until they were fortunate enough to catch some more and so make up a cargo worth taking to the Mobangi. When times were bad, these poor starving wretches might often be seen tied up, just kept alive with the minimum of food. A party would be made up and two or three canoes would be filled with these human cattle. They would paddle down the Lulonga, cross the main river when the wind was not blowing, make [it] up the Mobangi and sell their freight in some of the towns for ivory. The purchasers would then feed up their starvelings until they were fat enough for the market, then butcher them and sell the meat in small joints. What was left over, if there was much on the market, would be dried on a rack over the fire, or spitted, and the end of the spit stuck in the ground by a slow fire, until it could be kept for weeks and sold at leisure.¹⁰³

A traveller named Herbert Ward described the slave-markets he had seen on the banks of Congo tributaries:

A visit to one of these slave-depots revealed a condition of savagery and suffering beyond all ordinary powers of description. It was no uncommon experience to witness upwards of a hundred captives, of both sexes and all ages,

including infants in their mothers' arms, lying in groups; masses of utterly forlorn humanity, with eyes downcast in a stony stare, with bodies attenuated by starvation, and with skin of that dull grey hue which among coloured races is always indicative of physical disorder.

Proportionately, a greater number of men than women fall victims to cannibalism, the reason being that women who are still young are esteemed as being of greater value by reason of their utility in growing and cooking food.

Probably the most inhumane practice of all is to be met with among the tribes who deliberately hawk the victim piecemeal whilst still alive. Incredible as it may appear, captives are led from place to place in order that individuals may have the opportunity of indicating, by external marks on the body, the portion they desire to acquire. The distinguishing marks are generally made by means of coloured clay or strips of grass tied in a peculiar fashion. The astounding stoicism of the victims, who thus witness the bargaining for their limbs piecemeal, is only equalled by the callousness with which they walk forward to meet their fate.¹⁰⁴

Garry Hogg mentions a correspondent of *The Saturday Review* writing how, among the tribesmen of west Africa, "Young boys are brought from the dark interior, kept in pens, fattened upon bananas, and finally killed and baked."¹⁰⁵ Sir James Brooke, the first Rajah of Sarawak, relates from the opposite side of the world how a Jangkang might "borrow a fat child from his neighbour" to make up part of a feast, which he would later repay "with a fat child of his own."¹⁰⁶

The slaves of the Old World were fortunate in comparison, being in demand for their physical rather than their culinary attributes. What we may need to consider, however, is that in the remote past, they may

have shared the same fate—that the taking of slaves has its origins in the savagery associated with cannibal practices. And as outlandish as it may seem, there may even be merit in the idea that keeping *homo* alive for the pot was the natural precursor to the domestication of animals.

Be that as it may, both cases—whether capturing the enemy for food, or for labour—would have had far-reaching genetic implications. Slaves had the potential to survive, even under the extreme conditions of being kept as livestock. And for as long as they survived, the exchange of genetic material between themselves and their overlords would have been inevitable.

Hammurabi, the eighteenth-century BC king of Babylonia, decreed, for instance, that slaves could own property and marry free women. The Hebrews, according to the Old Testament, stipulated a limit of seven years to the period of servitude. Other cultures, again, allowed the freeing of slaves by manumission—the formal release from slavery by the owner as a gift for outstanding service, by bequest of a will or even through self-purchase.¹⁰⁷

Under these conditions, the victors in effect became assimilated with the vanquished. The victors, in a sense, thus determined the genetic composition of future generations by virtue of selecting those taken into slavery. It's a unique phenomenon. The Ancient Persians are known to have *bred* their own slaves, while in other cultures, it was common for the finest female slaves to end up as concubines.¹⁰⁸ In more recent times, by consumer demand, the best *physical* specimens made their way from the African slave markets to the New World.

The topic becomes even more intriguing when considering the selection of slaves from a cannibalistic perspective. What, after all, in the adrenaline-saturated aftermath of battle, goes through the mind of the club-wielding cannibal when he selects those worthy as

‘livestock’? Which human qualities would prevail under these conditions?

I leave it to the reader to speculate. Suffice it to say, these qualities may very well form a part of what we have become.

VENERATION

One of the hapless fates of slaves was to be interred along with their deceased masters. Entire retinues of servants could end up this way, their necks broken and positioned humbly at the feet of their overlords—the belief being that they should continue their services into the afterlife. Pharaohs, emperors, kings, and noblemen thus enjoyed the privilege of departing for the ‘other world’ with their finest treasures, their horses, and their personal attendants. It’s a custom steeped in the ancient mythology of the afterlife, where gods and goddesses presided over offerings and ceremonies, managed the transition to the ‘other world’, and even received the resplendent newcomers.

The parallel killing of the slaves of a deceased cannibal chief, where religious sentiment was confined to the mysterious powers of human body parts, suggests a lugubrious genesis, however. For cannibals, it was a matter of ownership. Dead owners implied available slaves, and as slaves were considered no more than livestock, their contribution to the departure of their master was to be served up as the main course at the accompanying feast. Indeed, the sense of ownership in some cases extended to the deceased’s wife as well, where in New Zealand, for instance, she might voluntarily yield herself up for slaughter.¹⁰⁹ Garry Hogg mentions that missionaries serving in the Baptist Mission fields of the Congo Basin *circa* 1900 described burial rites where “wives, relatives and slaves of chiefs who had died were slaughtered on his grave and then cooked and eaten by the remainder of the tribesmen.”¹¹⁰

Modern funerary practices are fortunately worlds apart, but there are nonetheless similarities that call for closer scrutiny. Cultures the world over, for instance, provide a ‘feast’ for mourners, which in some cases must be eaten in the presence of the corpse—ostensibly to allow the deceased to participate. In present day Estonia and west Siberia, it is the custom of certain communities to eat their meals in the graveyard, making certain that no leftovers are taken home.¹¹¹ In Bavaria, it was once tradition to place funerary cakes *on top* of the corpse before they were baked, and those who subsequently shared in the eating ‘were held to have absorbed some of the virtues of the deceased’. In Wales, again, it was customary to pass the funerary meal *over* the corpse before eating.¹¹²

What are we to make of traditions such as these? In the past (and among certain cultures to this day), the slaughter of an animal was customary, and mourners subsequently feasted on *flesh* as their last respects. The practice was so widespread, in fact, that Roman law stipulated that a grave was not legally a grave unless a pig had been sacrificed at the internment.¹¹³

The funerary meal is a practical necessity, of course. Those who have come to pay their last respects need to be fed, particularly when travelling long distances. But this was not necessarily the case in the archaeological past, when roving bands of cannibalistic hominids laid their dead to rest. Indeed, cannibals had a very practical approach when dealing with the deceased. Several travellers and explorers of the past commented on the absence of graves in the territories of ardent cannibals; the reasons were self-evident—cannibals ate their dead, some even distinguishing themselves as cannibals solely by the practice. And by the testimony of cannibals themselves, this was done not so much for the acquisition of the much-coveted human flesh as it was out of respect for a loved-one.

A. H. Keane, ethnologist and Fellow of the Royal Geographical Society, provides us with the following relevant information regarding Amazonian tribes at the turn of the twentieth century:

The Amajuacas of the Ucayali near the old Peruvian frontier, have been over and over converted to Christianity, each time relapsing and murdering the evangelists. The Cashibos, also of the Ucayali, eat their aged parents, but perhaps more from religious sentiment than from cruelty. But religion certainly has nothing to do with their habit of imitating the cry of game, to decoy and then devour hunters in the forests.

Before their conversion, it was the practice of the Cocomas of the Hualaga, but now removed to the Ucayali, to eat their dead relations, and to swallow the ground-up bones in fermented drinks, on the plea that it was better to be inside a warm friend than buried in the cold earth.¹¹⁴

In Australia, the author Colin Simpson describes the following:

Human flesh-eating among many tribes was a sign of respect for the dead. At a Dieri burial, relatives received, in strict order of precedence, small portions of the body-fat to eat. "We eat him," a tribesman said, "because we knew him and were fond of him."¹¹⁵

Garry Hogg cites an incident in New Guinea which echoes this sentiment:

Murray himself reports the case of a young man near Port Moresby who was unfortunate enough to fall into the river and be snatched at by a crocodile. Only a portion of his body, however, was eaten by the crocodile. The young man's

wife and children, accompanied by his father and mother and some close friends, thereupon sat down by the river side and ate the remains of his body. When questioned about their apparently callous act, they answered that they had done what they did "out of affection."¹¹⁶

This practice, as remote as it may seem to our modern sensibilities, may still prove to be the most prominent vestige of cannibalism to survive in present-day cultures. To put this into perspective, we need to consider the *method* in which cannibals prepared their meat for consumption. Obviously meat may be eaten raw, smoked, or grilled over a fire. Among cannibals, however, the pit-oven featured prominently:

They dig a hole in the earth two feet deep, in which they make a quantity of round stones red-hot with dry wood, after which they take out all the stones except a few at the bottom, over which they lay several alternate tiers of leaves and flesh, until there is as much above the ground as below. They then throw about two or three quarts of water over all, and confine the steam with mats and earth so completely that in 20 minutes the flesh is cooked; it is in this way that they cook and cure all their provisions.¹¹⁷

An eyewitness account of cannibalism in the Tonga Islands by William Mariner, who became involved in inter-tribal skirmishes early in the nineteenth century, elaborates further:

Some of the prisoners were soon dispatched. Their flesh was cut up into small portions, washed with sea-water, wrapped up in plantain-leaves, and roasted under hot stones. Two or three of them were also baked whole, the same as a pig.

The carcass was rubbed over with the juicy substance of the banana-tree, after which it was thrown for a few minutes on the fire. Then, when it was warm, it was scraped with mussel-shells or knives, and then washed. It was next laid on its back, when the cook cut open the throat and drew forth the windpipe and gullet, passed a skewer behind them, and tied a string tight round the latter, afterwards to be divided.

He then cut a circular portion from the body, from four to six inches in diameter, and drew forth the entrails, separating the attachments either by force or by the use of bamboo. The diaphragm was then divided, and the gullet, windpipe, contents of the chest, stomach and liver, were all drawn together, along with the bowels. From these, the liver was separated, to be baked with the carcass; the remainder was washed and cooked over hot embers, to be shared out and eaten in the meantime.

The whole inside of the carcass was next filled with hot stones, each wrapped in bread-fruit leaves, and all the apertures were closed up quickly, with plugs of leaves. The carcass was then laid, with the belly downwards, in a hole in the ground lined with hot stones, a fire having previously been made there for that purpose, but prevented from touching them by small branches of the bread-fruit tree. A few other branches were then laid across the back of the carcass, and plenty of banana-leaves strewn, or rather heaped, over the whole; upon which, again, a mound of earth was raised so that no steam could escape. The liver, as aforementioned, was placed beside the carcass, and sometimes yams also. By these means, the carcass could very well be cooked in about half an hour.¹¹⁸

It must have occurred to Mariner that the pit-oven—shoulder width, the length of a man, and upon which a

mound of earth was raised—bizarrely resembled the most solemn of our cultural landmarks, the final resting place of our loved-ones. And as outrageous as this may seem, we may have to consider the possibility that our funerary traditions hark back to practices such as these. The termination of cannibalism does not imply the cessation of the rites associated with it, after all. We find in Angola, for instance, that while the deceased were not prepared for consumption, they were nonetheless “baked in a hole within the hut” and then exhumed and smoked, the result resembling a mummy.¹¹⁹ In Queensland, the body was “dried over a fire or in the sun,” after the internal organs had been removed, and then buried.¹²⁰ The Baganda of Uganda, again, would place pumpkin seeds in the hands of a dead man, which the eldest son was required to remove with his lips and chew. John Roscoe, a missionary who spent more than a decade among them, elaborates on this custom:

A pot of butter was placed near the head, and some sponges, made from the core of the plantain stem such as were used for washing the hands before and after eating meat, were put by it. Each member of the family walked into the house, and, as they passed, they rubbed a little butter on the forehead of the dead, and wiped their hands on one of the sponges; this ceremony was called ‘taking leave of the dead’ (*kuziraga*).¹²¹

Several traditions suggest that the flesh of animals may, at some stage, have replaced the consumption of human flesh. Bambwa tribesmen, according to Roscoe, would slaughter a goat, eat the meat, and place its head on the grave.¹²² The Pedi, again, would bury their dead wrapped in the skin of the slaughtered animal.¹²³ Thousands of years apart, the blood of the animals

slaughtered for the funeral feast of Patroclus (*The Iliad*) was poured around the corpse and animal fat spread over it.¹²⁴

Among the Zulu, where skin-cloak burial was considered a stately internment, another intriguing tradition was observed. The missionary and author A. T. Bryant, who 'lived and laboured' among them for many years, writes as follows:

The grave itself was a round pit, three or four feet deep, in the wall of which a niche or alcove had been excavated, sufficiently large to receive the body. Into this grave the principal wife now descended, and received from the men above her husband's corpse, which she carefully placed within the niche, seated upon a mat of hide or rushes, and facing toward the *isiBaya* or cattle-fold.

The remainder of the ceremony was thenceforward continued by the men, the wives (but not the sons and daughters) of the deceased meanwhile kneeling in a bowed or squatting posture near the grave in silent grief. Some of the men brought along a number of stones from the river or elsewhere, each stone being carried in the palm of the hand and resting upon a small pad (*iNkata*) of grass. These stones [...] were an integral part of the burial procedure, and the grass-pad between them and the bearer's hand was intended to 'insulate' him technically, from actual participation in that burial and consequent contamination, and so save him from going through the purificatory rites. Upon reaching the graveside each man gently threw upon the ground both stone and pad, and went away. One of the actual burial-party, already descended into the grave, then reverently took the stones and therewith propped up the squatting corpse, lest it topple over, by slipping

them beneath the thighs and buttocks or as otherwise needed.¹²⁵

Carrying the stones with the aid of grass-pads brings to mind the breadfruit leaves that Tongan cannibals used when dealing with heated stones. The deceased is furthermore 'propped up' with these stones before the grave is filled.

The inclusion of stones in burials was not uncommon in prehistoric times. Many graves were lined with them, and in several cases, stones were placed beneath or above the cadaver. One individual at Karavaikha of the Russian Late Neolithic, for instance, had been buried face down with three large stones on its back. Several Upper Palaeolithic burials, again, indicate that the dead had been laid out on burning hearths and were partly burned as a result.¹²⁶

The 'squatting' or contracted burial posture employed by the Zulu and other African tribes survives as one of the earliest known forms of internment, with the bodies alternately being deposited upright, laid on the side, or on the back. A Neanderthal specimen discovered at La Chapelle-aux-Saints, France, for instance, is suspected of having been deliberately interred in this position some 50 000 years ago. There is evidence that the barrow people of the British Isles did the same, and at Tarkhan, south of Cairo, the Egyptians of the second and third Dynasties (*circa* 2900-2600 BC) are known to have tightly bandaged their dead in the contracted position before being interred.¹²⁷

A curious parallel is found among Fijian cannibals. The Rev. David Cargill wrote in 1838 how the victim is "made to sit on the ground with his feet under his thighs and his hands placed before him. He is then bound so that he cannot move a limb or a joint. In this posture he is placed on stones heated for the occasion,

and then covered with leaves and earth to be roasted alive.”¹²⁸

Implying that there may be a connection between Egyptian and Fijian customs is a little over the top, of course. Until, that is, we learn from the pyramid texts how “the King is one who eats men and lives on the gods” and that “it is Shezmu who cuts them up for the King and who cooks for him a portion of them on his evening hearth-stones.”¹²⁹ By the admission of the texts themselves, in other words, the Egyptians may well once have practiced cannibalism. And if there is no record of this historically, then it can nonetheless be argued that some of the rites associated with the practice may have survived, a case in point being contracted burial.

By implication, there must have been a transition from interring the individual for consumption (which, as a funerary rite, was done out of respect, as we have seen) to interring the individual (again, out of respect) but leaving the body undisturbed. This transition, if contemporary evidence is anything to go by, was not a smooth one. Graves have been desecrated since time immemorial, and given their bizarre guise as pit-ovens, this is perhaps not surprising. There is the distinction, of course, that the so-called ghouls of folklore (a very real phenomenon) ate the dead uncooked, waiting until the flesh had been partly decomposed before indulging, and from this we can deduce that for those involved, cannibalism had essentially outlived its relevance, as the culinary aspects of the practice were no longer the objective.

What could have led to the transition is an open question; albeit it would seem to have coincided with the arrival of crop cultivation and animal husbandry. Surviving accounts of funerary practices involving cannibalism (if only symbolically) do give us an idea, however, of the extent to which the cultural aspects of

the phenomenon persisted well beyond it having any nutritional significance.

The burial customs of the Zulu people, as recorded by A. T. Bryant, include a curious tradition which takes place on the third day after death:

From each of the internal organs (bowels, stomachs, etc.) of the ox slaughtered for the wives, a small piece was snipped off and cast into a small cooking pot. Along with this meat were mixed certain very bitter (probably tonic) herbs; and after all had been cooked together and become a thick mass, each wife took out a handful from the pot and did her best, with many wry grimaces, to gulp it down.¹³⁰

The explorer Algot Lange, who lived among a tribe of Amazonian cannibals, mentions something similar:

I soon learned that it was impolite to refuse any dish that was put in front of me, no matter how repugnant. One day, the Chief ordered me to come over to his family triangle and have dinner with him. The meal consisted of some very tender fried fish, which were really delicious; then followed three broiled parrots, with fried bananas, which were equally good. But then came a soup which I could not swallow – the first mouthful almost choked me. The meat which was one of the ingredients of the soup tasted and smelt as if it had been kept for weeks, and the herbs which were used were so bitter, and gave out such a rank odour, that my mouth puckered and the muscles of my throat refused to swallow. The Chief looked at me, and frowned – and I remembered the forest from which I had lately arrived, and the starvation and terrors. I closed my eyes and swallowed the dish, seeking what mental relief I could find in the so-called auto-suggestion.¹³¹

Had Lange refused the dish, he would, in all probability, never have returned to civilisation. By all indications, the honour of *manger le mort* had been bestowed upon him—eating the dead—and to refuse would have been sacrilege.

Alfred R. Wallace, the naturalist who jointly published the theory of natural selection with Darwin, gives a brief account of this custom among some of the tribes he came into contact with:

The Tarianas and the Tucanos and some other tribes, about a month after the funeral, disinter the corpse, which is by then much decomposed, and put in a great pan over the fire till all the volatile parts are driven off with a most horrible odour, leaving only a black, carbonaceous mass, which is then pounded into a fine powder and mixed in several large vats made out of hollowed trees, filled with caxiri. This is then drunk by the assembled company till all is finished.¹³²

Not all those observing similar traditions were inclined to a dish quite as diabolical, however. Several would disinter a corpse after only a few days, once decomposition had set in. The reason, according to a Hamatsa (one who is initiated into cannibalism) of the North American Kwakiutl Indians, was that “it is very much harder to consume fresh human flesh than the dried flesh of corpses.”¹³³

So-called witches, with motives other than respect for the dead, would disinter a corpse at any given time, and as a result several cultures in the past routinely guarded the graves of their dead until, as A.P. Rice put it, “the body had probably become too loathsome” to eat.¹³⁴ (From this perspective, the funerary ‘vigil’ has practical, rather than esoteric relevance.) The sabbat

feast of Medieval witches, according to the author Laurant Paine, included 'roast corpses', and obscure formulas were concocted from the nails, teeth, hair, and other body parts, with a moss that grew on the skull being in particular demand.¹³⁵ "The Devil being sought unto by witches," William Perkins aptly commented back in 1608, "appears to them in the likeness of a dead body."¹³⁶

Desecration was not the intent of those who exhumed the dead and then dutifully re-interred the bones once the flesh had been eaten, of course. Cannibals who consumed their dead 'out of affection' still had the skeletal remains to take care of, and returning these to the ground out of reach of prowling carnivores was considered not only a duty but a mark of respect. Given the unsavoury practices involved, however, one would imagine that the consumption of the remains eventually came to an end, and that only the ritual or symbolic aspects of the custom persisted. These, arguably, were then handed down to us in the form of secondary burial rites, with the cannibal connotations long forgotten.

Secondary burial, where only the bones of the deceased are reburied, has been practised by different cultures throughout the world. Invariably it involves removing the flesh from the bones which are then washed, oiled, polished, or covered with ochre, depending on the traditions involved. The remains are then either placed in a tomb or such or returned to the ground. In some cases, years could go by before the rites of re-internment were performed, thus allowing the flesh to fully decompose and facilitate the cleaning of the bones. Of interest in this regard is that the sacred Zoroastrian text, the Vendidad, proclaims a penalty of "a thousand stripes" for those who do not disinter their dead within one year.¹³⁷

The Tibetans and the Parsees of India allow vultures to pick clean the remains of their dead, thus circumventing the process of decomposition, while the Sioux

and other Plains Indians would expose the dead to the elements on raised platforms.

The two-part burial is recognised as integral to ancestor worship, a belief system which Herbert Spencer termed “the root of every religion,”¹³⁸ and the roots of ancestor worship, it would seem, can be traced back to a cannibal past.

6

ECCE HOMINUM

It is the way of the Earth to make no display of completed work, but to bring everything about vicariously— I Ching

“**B**ehold, this is Man,” the Latin heading implies.

Behold, indeed. What an extraordinary creature. What an extraordinary past. So extraordinary, in fact, that Man considers himself somehow unique, as having no part in the animal kingdom, and in many ways, he has no equivalent in nature. Every corner of the globe is under his dominion, every apex predator entirely at his mercy ... and this while his closest living relatives still grunt and squeal in the few remaining enclaves they call home. Understandably, it would seem as if he were moulded by a higher hand.

The fact of the matter is, however, that Man was once indistinguishable from the great apes. There was a time when he too was semi-erect and covered in fur and preferred his termites *tartare*. What is it then that set him apart? What is it that set in motion the development of a creature that would ultimately dominate the entire planet?

A myriad of anomalies comes to mind—we are hairless, articulate, bipedal tool users, to state the obvious. But then these are attributes that can be considered the *result* of our having parted ways with the apes—the separate aspects of an evolutionary *package*. On their

own, after all, they don't carry much weight. What relevance does bipedalism hold for articulation at the end of the day, when verbalisation might just as well have developed among the branches? If terrestrial activity is an incentive for tool usage, then why is the gorilla—or the baboon for that matter—no better at it than the orangutan that spends ninety percent of its waking hours in the trees?

Something more profound was behind our development.

The fossil records sketch an intriguing background in this regard. Based on the evidence of cutmarks alone, we've been meat-eaters for literally *tens of thousands* of *generations*. And we're not talking about the leftovers of carnivore kills, but meat that was *hunted* down. It stands to reason that vocalisations would have been put to good use under these conditions and that tool usage would have been a feature. And from this perspective, our humanness is perhaps not so much an aspect of our having become bipedal as it is of our having become predatorily inclined.

If we were to trace our footsteps back into the past to establish at what point we broke ranks with our primate kin, then it would have to be the day that we took an interest in meat. More precisely, perhaps, it would have been the day that we managed to *procure* meat, for even a rabbit will eat flesh given half a chance. Carnivory, at the end of the day, sets us apart. A change of habitat and the adaptations that go along with it is one thing; the transformation from vegetarian to carnivore is quite another. We went our separate way when we became *killers*.

The question is, were we tree-dwellers at the time, or bipeds?

By some quirk of fate, our cousins, the chimpanzees, have also become killers. Their choice of prey, which for the most part consists of immature primates, suggests, however, that they are at the early stages of a

predatory transition. They are, essentially, *delinquent* predators making the most of their own ecological niche, and as such they may shed some light on our own carnivorous beginnings.

In Côte d'Ivoire, at the Taï National Park, chimpanzees hunt monkeys almost to the exclusion of other prey. In one study, seven years of observations revealed just one incident where a non-primate was the quarry.¹ Similarly, at the Kibale forest in Uganda, ninety-two point five percent of kills recorded over a five year period were colobus monkeys.² In Tanzania again, at the Gombe National Park, red colobus monkeys constituted eighty-four point five percent of the prey caught between 1990 and 1995.³

Mostly infants and juveniles fall foul of the chimpanzee's appetite, although females are also regularly killed given their close association with the young. This is to be expected within the context of *predatory delinquency*—the most vulnerable, after all, will be prioritised. What is unexpected is that the hunt, to a large degree, is executed from the ground. Potential prey is identified by scouring the canopy from the forest floor, and only once participating hunters have the escape routes covered does the chase commence.

Chimpanzees, given the benefit of hindsight, find themselves at the wrong end of a weight disparity; size matters if you want to overpower your prey, and the forest canopy favours the light-weighted—those that can negotiate thick brush and slender vegetation. Randomly pursuing smaller prey through the treetops, in other words, is hardly the way to go, and chimps have consequently learned to operate from the ground to produce better results. By implication, *predation* is increasing their proficiency on the ground and not, as one would imagine, the other way around.

In some areas, terrestrial mammals have become a regular source of protein. Jane Goodall's observations at Gombe in the 1970s revealed that piglets and

bushbuck fawn were often snatched from their mothers to be eaten. In the Mahale mountains to the south of Gombe, infant blue *duikers* are the preferred target, representing twenty-seven percent of the total number of prey captured in one particular study.⁴ In the Congo again, among the Kokoalongo chimps, forty-four percent of the prey caught between 2016 and 2020 were *duikers*,⁵ while in Uganda, among the Waibira troop of the Budongo Forest, a figure as high as sixty percent has been recorded.⁶

Environmental factors will have an influence on hunting patterns, of course, but it nonetheless stands to reason that increased proficiency on the ground will inevitably lead to an increase in terrestrial prey. And judging by the figures above, this could become lucrative enough to lead to a significant *reduction* in arboreal activity, suggesting that in the long run, the morphology of the chimps could become more and more suited to conditions on the ground.

This is essentially where the story of humankind begins. At some stage of our development, the foot had become of greater value on the ground than among the trees. Whether this was the result of a predatory disposition similar to that of the chimpanzees remains anyone's guess, but at some point, we nonetheless became *terrestrial* predators. And as evidenced by certain chimpanzees, our source of animal protein, other than perhaps reptiles and rodents, may initially have been limited to piglets and infant antelopes. The hominoid anatomy, after all, is not equipped to deal with fleet-footed prey, and larger mammals would simply not have been within our reach.

Unless, that is, we include terrestrial *primates*.

Proto-Man, like the chimps, in all likelihood hunted in groups. On the ground, this may have involved the cooperative isolation of immature ungulates from their mothers, combined efforts to capture larger reptiles such as monitor lizards, and perhaps the pursuit of

flightless birds. If we add to this the potential for *delinquency*—which is not an outlandish idea considering the behaviour of the chimpanzees—then baboons and ground-dwelling apes like the gorilla can also be included.

Indeed, Proto-Man may have co-existed with a number of terrestrial apes. Species such as *anamensis*, *afarensis*, *deyirameda*, *bahrelghazali*, *platyops*, and *africanus* roamed the African landscape in the period 3 to 4 million years ago. Roughly a million years later, with the arrival of *Homo*, australopithecines such as *africanus*, *robustus*, *aethiopicus*, and *bosei* were also in existence. A meat-eating ape accustomed to conditions on the ground, in other words, that had an inclination towards *delinquency*, would most likely have found itself in a better position than the chimpanzee finds itself in today.

And as if to dispel any doubt whether mature apes such as the gorilla would be too formidable a prey for the likes of a chimpanzee, recent observations have revealed that chimps do, in fact, attack gorillas in the wild. In the Loango National Park in Gabon, two encounters were recorded in 2019 which led to the death of an infant gorilla in each case. A female chimp was seen playing with the lifeless body of the first infant, and it remains unclear what became of the carcass. In the second instance, however, most of the internal organs, both legs, and the brain had been consumed.

Researchers Southern, Dreschner, and Pika recount how, in the first encounter, “a group of approximately nine male chimpanzees (adults and adolescents), and at least one adult female chimpanzee surrounded the silverback and repeatedly jumped down on him and hit him whilst screaming and barking.”⁷ In the second encounter, several months later, a large troop of chimpanzees out on patrol came across a silverback with his females and their offspring in a large tree. In

the customary manner, the majority of the chimps climbed the surrounding trees while four adult males stayed behind. The gorillas, moving higher up into the canopy, started emitting alarm barks, and minutes later, the silverback rapidly climbed down and fled. Eventually only the female (AF1) and her infant remained:

At 12:48, four chimpanzee males (Ngondo, Orian, Pandi and Thea) started to chase the female first further up the tree, and then down the tree while barking and screaming. During approaches, the female (AF1) waved her arms and screamed towards the chimpanzees, whilst holding her infant (I1) to her belly, and simultaneously trying to move out of proximity of the chimpanzees. At 12:49, the gorilla female moved rapidly down the tree with her infant (I1) on her belly into a tangle of lianas. At 12:50, the gorilla female (AF1) was seen, without her infant (I1), climbing up a nearby tree ...⁸

At 01:00 pm, the adolescent female chimpanzee Greta was seen feeding on the lifeless infant, after which the adult female Roxy took possession of the carcass, sharing bits of the meat with five other chimpanzees.

Clearly, gorillas can be added to the chimpanzee's list of potential prey. Indeed, if we were to envisage the chimpanzees scouting for a meal 3 or 4 million years ago, then a *number* of ape species might be added to the list. And unlike antelope and pigs where only the immature are accessible, fully mature apes are also within the chimpanzee's grasp, as exemplified by the incident with the silverback above—the only problem being that chimpanzees are not accomplished enough to *kill* such large prey.

Primatologists C. and H. Boesch note how chimpanzees invariably kill infant and juvenile colobus monkeys with a bite to the head. Death is instantane-

ous. Adult colobus, on the other hand, presumably to keep clear of their canines, typically receive a bite to the belly, and eating commences while they are still alive. In Gombe, it has been observed that adult colobus may be killed by flailing the body so that the head is smashed against the ground or the branches of a tree.⁹ It goes without saying that attempting to employ the same methods with mature gorillas and baboons would have an entirely different outcome.

We know from the fossil records that at least one hominid was an accomplished killer. Mature bipeds were dispatched as readily as the immature by an unknown species going back a million years or so. This time frame is confirmed by the cut marks made during the butchering process and excludes the probability that other methods of slaughter could also have been employed. Inter-specific predation among hominids, in other words, may be far older than we dare to consider. Indeed, the practice may very well trace its origins back to conditions very similar to those observed among chimpanzees, where predation is typically initiated within the boundaries of a particular niche, the difference in this case being that the hominid lineage had progressed to the point where adult apes as formidable as the gorilla were being killed, and this was accomplished through the use of an extra-corporeal component—typically a stone or obsidian flake attached to the end of a shaft, as was the case among stone-age hunters.

The use of spearheads undoubtedly reflects a progression from more rudimentary weapons. A wooden shaft with a jagged end, after all, is enough to cause serious harm. This raises the question of the onset of weaponry. Chimpanzees have been observed using sticks that they sharpen with their teeth to kill bush babies, and in displays of aggression, males often brandish branches to convey the intention to do bodily harm; albeit there is no record of this ever having led to

physical blows. The potential is there, nonetheless, for the chimpanzees to become more sophisticated in their use of lethal tools, and one can envisage that sometime in the future they could resort to clubbing and stabbing as a matter of course.

A clubbing, stabbing ape is most likely what we once were.

Indeed, researchers Carrier and Morgan from the University of Utah have suggested that the robust features characteristic of early hominids indicate a 'protective buttressing' of the face. "The parts of the facial skeleton that are most subject to fracture during inter-personal violence in modern humans," they point out, "tend to exhibit disproportionally large dimensions in australopiths." Male rivalry and the use of fists led to the development of the massive jaws and cheekbones, in their opinion.¹⁰

A club, however, would have enjoyed the upper hand, and the idea of a bludgeoning instrument in the hands of these strong-boned australopithecines isn't that far-fetched. It is, after all, a scenario that the chimpanzees themselves are leaning towards (brandishing a stout stick is not far removed from brandishing a branch). Raymond Dart, from the onset, argued that the hands of *Australopithecus* must have served as "organs of offense and defence," given the absence of "massive canines"¹¹ and, furthermore, that the skulls of the baboons associated with the discovery of the Man-Ape "had not been pierced by teeth" but had been fractured. "They belonged to animals that had been killed by objects that had transmitted sharply localised force,"¹² he claimed.

It was the 'carnivorous habit', Dart contended, that had produced the unique features of *Australopithecus*. And if the chimpanzees are to progress beyond their 'habit' of hunting infants and juveniles, then they too must develop some of these unique features. They must, in essence, become hominised, not only in bodily

structure and function, but also in their implemental capacity ... they must learn to use objects that transmit localised force.

We humans may also once have been fledgling predators that practiced the art of hunting within our own niche. We too may have been introduced to mammalian flesh by preying on the vulnerable of our 'own kind'. But we went beyond the limitations that the chimpanzees now face and learned to harness tools, losing our 'massive canines' in the process. It is with our hands that we became adept at the offensive and defensive activity that is crucial for survival, and with our hands we learned to transmit 'localised force' to bring down larger animals.

Our only limitation is speed—we are not equipped to outpace fleet-footed, terrestrial animals.

The indications are that, from the earliest of days, we preyed upon the mature of our 'own kind'. In Dart's opinion, *Australopithecus* preyed on adult baboons and fellow bipeds; however, this remains to be seen. What we do know is that *antecessor* was hunted down by a biped, as were *erectus* and *neanderthalensis*, and, of course, *Homo sapiens* himself. In fact, *sapiens* continued hunting *sapiens* for the pot until only a few generations ago, when the practice was finally abolished by colonial authorities.

Our distinction as humans, at the end of the day, lies in our predatory transformation. We may be primates, but we have developed into fully fledged hunters—an elite group of animals at the top of the food chain.

Our hominization—the changes that distinguish us from the apes—reflects this transformation.

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